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BURIED DRUM AREA EXCAVATION QUEEN CITY FARMS SUPERFUND SITE MAPLE VALLEY, WASHINGTON

FINAL CLOSURE REPORT VOLUME I OF II

Prepared for
The Boeing Company
Queen City Farms
22715 S.E. 168th Way
Maple Valley, WA 98038
December 15, 1995

Woodward-Clyde

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December 20, 1995
4-1261-QCF-089

22715 S.E. 168th Way
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Loren McPhillips
USEPA
1200 Sixth Avenue, HW-113
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BOEING

Dear ~~Loren~~, Neil

Enclosed are two copies of the Queen City Farms Buried Drum Area Final Closure Report prepared by Woodward-Clyde. One copy was sent to Phil Stoa, Army Corps Of Engineers. This report was prepared in accordance with the guidance *Remedial Action Report Documentation for Operable Unit Completion* (USEPA, June 1992).

Volume I of this report summarizes and documents the activities performed at the site related to the Buried Drum Area activities and observed in the Final Inspection. Volume II is a compilation of data generated as a result of this remedial action.

If you have any questions or need additional information please let me know.

Very truly yours,

Brian Anderson

Brian Anderson
Queen City Farms Remediation Project
M/S 6Y-06, Phone: 391-9315

enclosure

cc: Phil Stoa, with enclosure

Woodward-Clyde

Engineering & sciences applied to the earth & its environment

December 15, 1995
944057NA/0016

Mr. Brian Anderson
Project Geologist
The Boeing Company
Queen City Farms
22715 S.E. 168th Way
Maple Valley, Washington 98038

SUBJECT: FINAL CLOSURE REPORT
BURIED DRUM AREA EXCAVATION
QUEEN CITY FARMS SUPERFUND SITE

Dear Brian:

As per your direction, please find enclosed seven copies of the referenced report. It is my understanding that you intend to forward three copies to the EPA. As always, I stand ready to answer any questions or be of further service should you so need.

In closing, I'd like to acknowledge that it was a pleasure delivering this project and I am convinced that it was a success. This was due, in large part, to the exemplary partnering attitude exhibited by yourself and the other Boeing staff. I look forward to other opportunities to work with Boeing and particularly you and "the guys at the site".

Sincerely,

WOODWARD-CLYDE CONSULTANTS

Edward J. Rogan

Edward J. Rogan, V.P.
Project Manager
:
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cc: Tarmo Pajutee, WCFS/Portland
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SECTION 1

Introduction

The Queen City Farms Superfund site (the "Site") is located approximately 3 miles northwest of Maple Valley, King County, Washington (Figure 1-1). The Site was placed on the National Priorities List (NPL) in September 1984. An Initial Remedial Measure (IRM) was performed at the Site in 1986 that included removal and containment measures which addressed sludge and liquid contamination at the Site. The IRM only partially addressed soil contamination, and did not deal with ground water contamination at the Site. As a result, the U.S. Environmental Protection Agency (EPA) executed a Record of Decision (ROD) on December 31, 1992 which addressed the final response actions to be implemented. A Consent Decree (CD) was negotiated and executed on November 8, 1994 regarding this final remedial action.

The selected remedy consists of eight Remedial Action (RA) elements, which together constitute the final response action for the site. This final action addresses remediation requirements for four units at the site: the IRM area, Aquifer 1, Aquifer 2, and the Buried Drum Area (BDA). The remedial action elements are as follows:

- Light Non-Aqueous Phase Liquid (LNAPL) Immobilization - Includes product-only pumping, off-site treatment and disposal to reduce the mobile residual LNAPL within the Barrier System;

- BDA Soil and Debris Removal - To remove and treat the BDA debris, which includes excavation, off-site disposal of soil and debris with high contamination levels, placement of soil with low levels of contamination beneath the IRM cap expansion, and backfilling of uncontaminated soil;

- Barrier System - Includes a vertical barrier wall around the IRM Area, expansion of the existing IRM cap to include the area bounded by the wall, and extension of the existing surface water drainage system to accommodate the cap expansion area;

- Barrier System Dewatering and Ground Water Treatment - Includes both short-term and long-term ground water extraction and treatment from within the Barrier System to minimize discharge of contaminated water from the barrier system to Aquifer 2;

- Aquifer 1 and 2 Contingent Extraction and Treatment - Includes design of extraction and on-site treatment systems for both aquifers, to be implemented as a contingent action only if triggered by criteria identified in the CD and the ROD;

- Monitoring - Includes long-term sampling and testing of ground water, surface water, and off-site private drinking water wells, to monitor and evaluate the performance of the remedial action;

- Institutional Controls - Includes deed restrictions and fencing to control land and ground water use and maintain remediation facilities, and contingent provision of alternative water supply to off-site private well owners, if needed;

- Contingent Passive Soil Venting - Includes treatability testing and evaluation for potential long term passive venting.

For the Buried Drum Area remedial action element, Woodward-Clyde Consultants (Woodward-Clyde) and their primary team member, CET Environmental Services, Inc. (CET), were selected to perform design/build services. This task involved the excavation, sampling, sorting, and temporary on-site storage of hazardous and non-hazardous soils and debris from the BDA (Figure 1-2). Contaminants of concern for this remedial action include Arsenic, Cadmium, Chromium III, Chromium VI, Lead, PCB's, and PAH's. This Final Closure Report summarizes the work performed for this remedial action element.

Chronology of Events (for BDA RA)

- December 31, 1992 - ROD issued
- November 8, 1994 - CD effective
- May 25, 1995 - Submittal of Draft BDA TRD to EPA
- July 5, 1995 - Final BDA TRD approved by EPA
- July 11, 1995 - Construction Mobilization began
- July 13, 1995 - Site Specific Health and Safety Training Session
- July 13, 1995 - Clearing and Grubbing Operations
- July 14, 1995 - Construction of Sampling Stockpiles
- July 19, 1995 - Excavation of BDA began
- September 22, 1995 - Completion of Demobilization Activities

Performance Standards

Performance standards are the criteria or requirements which must be met in completing the project and they include cleanup levels, quality criteria, and other substantive requirements, or limitations found in the Record of Decision.

As specified in the CD and the ROD, the objectives of the BDA excavation element of the RA are to permanently remove and treat the BDA debris, and permanently control the mobility of any residual contaminants remaining after excavation and removal of the primary debris source. The performance standards to be met for this element of the overall RA include either management in-place, management below an extension of the existing IRM cap, or off site disposal. The hazardous substances of concern and the relevant allowable concentration thresholds associated with each of these management options is presented in detail in Section 2.3.

The initial excavation of the BDA was completed on August 21, 1995, at which time 7,800 cy had been excavated stockpiled and sampled. Upon completion of the initial BDA excavation, verification samples were obtained from the bottom and sides of the excavation. As a result of the verification sampling and analysis, additional bottom and wall grids were re-excavated and resampled until cleanup goals were achieved.

In only one instance (verification grid #6) was the excavation halted without meeting the performance standards. When the excavation of verification grid #6 had reached a depth exceeding 22 feet, the EPA on site representative was consulted and permission to close the excavation was granted. The additional excavation as a result of the verification sampling and analysis yielded another 1,780 cy, bringing the total volume excavated to 9,580 cy. These activities were completed on August 30, 1995.

In conclusion, all soils and debris excavated were handled in compliance with the performance standards as specified in the table presented in Section 2.3 with the sole exception being verification grid #6. Of the total volume excavated (9,580 cy), approximately 275 cy of soil were characterized as Dangerous Waste. These soils, along with approximately 190 cy of contaminated debris, were transported and disposed of off site. Approximately 7,200 cy of soil and debris were characterized as marginally contaminated and as such, were stockpiled and secured on site for eventual management below the extension of the existing IRM cap. A total of 2,100 cy of soil and debris were characterized as clean and utilized as backfill in the BDA excavation.

Construction Activities

Prior to initiation of any on-site construction activities, a pre-construction safety meeting was conducted for site workers. All construction activities were performed in accordance with the site Health and Safety Plan (HSP) presented in the TRD.

Preliminary construction activities included clearing and grubbing, internal fence removal, and installation of an erosion control barrier (silt fence) northwest of the BDA. Once the preliminary activities were completed, the interim soil stockpile areas were constructed. Sixteen 100 cy stockpile (25-foot by 25-foot footprint) areas were constructed before and during excavation activities for temporary storage of soil during analytical testing.

Excavation of the defined BDA began July 19, 1995. All excavated materials were sorted and sampled as described in the TRD. Many of the drums encountered during the excavation were intact and contained free liquids and oily tar substances. These drums were placed in overpack drums and stored for future analysis and disposal. Drum fragments which did not contain free liquids were stored in roll-off boxes.

Excavated soils were field-screened for the following contaminants: metals; polychlorinated biphenyls (PCBs); and polycyclic aromatic hydrocarbons (PAHs). In addition to the field screening, off-site confirmation or verification analyses were performed.

Temporary storage areas were constructed for the storage of marginally contaminated materials, hazardous materials, and overpack drums encountered. These areas were graded, leveled, bermed, and lined with geotextiles. Soil or material determined to be clean by field-screening techniques was temporarily stockpiled and thereafter utilized as backfill within the excavated BDA.

After completion of all excavation, screening, and material segregating activities, the site was restored as necessary. The dangerous waste and marginally contaminated soils and debris were covered and secured and the site roadways were restored to their original conditions. Demobilization of equipment and support items was the last field task. All equipment was decontaminated prior to release from the site.

Soil which was designated as dangerous waste, along with all debris from the excavation was loaded and trucked to Envirosafe Services of Idaho for final disposition. Soils regulated under the Model Toxics Control Act (MTCA) are contained and stored on-site for final disposition within the barrier wall and under the cap expansion. Profiles have been established for waste contained in overpack drums and are awaiting final disposition through Romic Environmental, Palo Alto, California. An addendum to this report will be submitted specifying details as to final disposition of the containerized waste.

Summary details for this remedial action element are as follows:

- Approximate area of BDA excavation is 35,000 sq. ft.;
- Excavation was generally 6 to 10 below surface grade;
- Approximately 11,000 cu. yds. of soil removed;
- MTCA soil stored on site is approximately 8,700 cu. yds.;
- Clean material backfilled was approximately 2,000 cu. yds.;
- Hazardous waste soil/debris was approximately 500 cu. yds.;
- 185 overpack drums for off-site disposal.

Final Inspection

A final site inspection for the remedial action performed in the BDA was conducted on October 26, 1995. Representatives from Boeing, EPA, and Army Corps of Engineers were on-site to inspect final site conditions. EPA accepted completion of field activities related to this task with no official check list items noted.

Attendees:

Boeing	Brian Anderson Wayne Schlappi Don Nyman Steven Adekoya
EPA	Loren McPhillips Bob Stamnes
ACE	Phil Stoa

Certification That Remedy is Operational and Functional

Boeing and Woodward-Clyde hereby certify that the QCF Superfund Site BDA excavation RA was performed in compliance with the design criteria as specified in the agency approved TRD (July 25, 1995) and that applicable construction-based performance standards have been met. The basis for this determination is presented in the Section 2.3 - Performance Standards and Construction Quality Control.

Operation and Maintenance

The Operations and Maintenance Plan as presented in the BDA TRD was successfully implemented. The plan detailed construction activities such as excavation techniques to be used, construction equipment, preventive maintenance, waste management, routine inspections, operating and monitoring data collection, and record keeping. Minor modifications to this plan were incorporated during construction operation to improve field operations and eliminate unnecessary work. These modifications include the upgrade of personal protective equipment (level B in work area), use of slightly different construction equipment, approach to excavation activities to be more protective from exposures and potential releases (eliminate excavation in lifts), and minimization of final site restoration.

Ongoing Operation and Maintenance will be necessary for the MTCA soils left on-site which will be later incorporated into the barrier wall and cap expansion. These soils are currently contained within a 20 mil HDPE liner which will be inspected weekly for duration of their temporary storage (approximately 6 months). A record of the inspection activity and observations will be kept on-site.

Summary of Project Costs

Table 1-1 presents a summary of the final estimated costs associated with this project.

SECTION 2

2.0 SERVICES PERFORMED

2.1 INTRODUCTION

This section presents the details of services performed during this remedial action element. The section is organized by contract task as presented in the cost summary of Section 1. The contract tasks are as follows:

- Mobilization
- Task Remedial Design
- Health and Safety Equipment/Personal Protective Equipment
- Clearing and Grubbing
- Fence Removal
- Erosion Control Measures
- Initial Excavation into Sampling Stockpiles
- Field Sampling and Field Screening
- Laboratory Analysis
- Stockpile and Store Highly Contaminated Soils
- Stockpile and Store Marginally Contaminated Soils
- Backfill and Compact Uncontaminated Soils
- Import, Backfill, and Compact Additional Fill
- Site Restoration
- Demobilization
- Closure Report
- Project Vehicles
- Other (Performance Monitoring)

2.1.1 Baseline Schedule

The proposed schedule for the planning, fieldwork, and reporting associated with the BDA excavation, including the preparation of the TRD, is presented in Figure 2-1.

2.2 REMEDIAL ACTION TASKS

2.2.1 Mobilization

Mobilization was initiated on July 11, 1995. Initial mobilization consisted of delivery of heavy equipment including a John Deere 690 Excavator, John Deere 644 Loader, John Deere 750 Dozer, a 10 cy dump truck, two 1- ton Flatbed Trucks, and a small Bobcat Loader with attachments. Project site management and field crews arrived, and were given a site indoctrination. The heavy equipment underwent a safety inspection. The Woodward-Clyde site operations trailer was delivered and positioned at the site. Additionally, the site support/utility trailer was delivered. This trailer contained the PPE, tools, small equipment and supplies intended for use during the project. Utility hookups to the site operations trailer occurred during the next 10 calendar days.

On July 13, 1995, a 4-hour site-specific health and safety training session was conducted. The Woodward-Clyde site-specific Health and Safety Plan and Boeing Site Rules was provided to each member of the field staff and crew, and reviewed in detail.

Additional equipment mobilization occurred throughout the project performance period. The Spectrace 9000 XRF was delivered on July 17, 1995. Another 10 cy dump truck was delivered on July 17, 1995. A 15-ton boom truck was mobilized on July 26, 1995. A John Deere 650 Dozer was delivered on August 15, 1995.

2.2.2 Task Remedial Design

The TRD was prepared and submitted to EPA in 95 percent Draft on May 25, 1995. After receipt and consideration of the agency-reviewed comments, the TRD was resubmitted and approved by EPA on July 5, 1995.

This TRD was organized as follows:

- Introduction
- Engineering Design
  - -ARARs Analysis
  - -Design Criteria
- O&M Plan
- Cost Estimate
- Project Schedule
- Contingency Plan

- Performance Monitoring and Evaluation Plan
- Field Sampling Program
- Health and Safety Plan
- Reporting
- References

Figure 2-2 presents the erosion control barrier design detail and the drum containment area cross section. Figure 2-3 presents the soil staging plan. Figure 2-4 presents the Dangerous Waste, marginally contaminated soil and interim soil staging area cross sections.

Each required task was described in detail in general groupings as follows: 1) preliminary activities (clearing and grubbing, fence removal, erosion control measures, pre-construction conference); 2) pre-excavation activities (preparation of the interim soil sampling stockpile areas, storage areas for Dangerous and MTCA Wastes, staging area for marginally contaminated soils); 3) excavation activities (initial excavation into sampling stockpiles, stockpiling and storage of Dangerous Wastes, stockpiling and covering of marginally contaminated soils); and 4) post-excavation activities (backfill and compact uncontaminated soils, import, backfill and compact additional fill, site restoration, demobilization).

The contingency plan presented in the TRD discusses the protocol and objectives for air monitoring and spill prevention, control, and countermeasures implemented during the BDA excavation activities.

The Field Sampling Program presented in the TRD describes the scope of work implemented during field and laboratory investigations during the BDA excavation activities. The specified overall goal was to determine the ultimate disposition of the excavated soils and associated debris and to verify that soils left in place at the BDA did not contain contaminant levels greater than the in-place management standards. Specific field sampling and field screening procedures are provided as appendices to the TRD, as were Quality Assurance/Quality Control (QA/QC) procedures.

A site-specific Health and Safety Plan is included in the TRD. The plan calls for initiating the work/excavation in Level B Personal Protective Equipment (PPE), to be conservative. Thereafter the level of PPE is based upon real-time monitoring.

2.2.3 Health and Safety Equipment/Personal Protective Equipment

The project was supplied with all required health and safety equipment and PPE. The majority of the necessary PPE was provided with the initial mobilization to the site inside the support/utility trailer.

Supplied air equipment was supplemented during the course of the project to account for the extended use of Level B personnel protection. Health and safety monitoring equipment consisted of a Mini-Ram for measuring airborne particulate, a Organic Vapor Monitor (OVM), and a combustible gas indicator (CGI). Mini-Ram readings were taken at points around the site, focusing primarily on the sampling stockpile work area. OVM and CGI readings were taken at both the point of excavation, as well as in or near any containers encountered, and at the sampling stockpiles. Monitoring logs were kept and forwarded to Boeing.

2.2.4 Clearing and Grubbing

Clearing and grubbing operations began on July 13, 1995. The slash material in the area north of the BDA was moved out by means of the 690 Excavator and the dump truck(s) on-site. All debris removed was taken to Cedar Grove Composting. North Bend Logging was retained to fall the timber in the area to be cleared, limb the fallen trees, and remove the logs from site. Tree falling began on July 17, 1995, and was completed the following day. Two trucks of logs were removed from the site. Clearing of slash, brush, and other undergrowth continued through July 18, 1995. At completion, a total of 65 dump truck loads were taken from site to the compost facility.

2.2.5 Fence Removal

Fence removal activities were initiated on July 12, 1995. Field crews removed portions of the IRM fence and rolled it into sections. The barbed wire strands on top of the fence were removed and rolled. The 690 Excavator was used to pull the fence posts from the ground. The gate sections were removed and taken to on-site storage for re-use by Boeing. The fence fabric, posts, and barbed wire were taken to Cedar Grove Recycling. Approximately 700-feet of interior fence was removed. It was not necessary to replace this fence.

2.2.6 Erosion Control Measures

The installation of the erosion control silt fence occurred on July 18, 1995. The silt fence was installed at the northern boundary of the work area, approximately 10-feet to 15-feet inside the perimeter of the clearing and grubbing. Seven hundred feet of silt fence was installed. The fence was left in place after demobilization.

2.2.7 Initial Excavation into Sampling Stockpiles

Pre-excavation activities associated with the initial excavation operation included the construction of the sampling stockpiles. The sampling stockpiles were constructed in the area south and east of the BDA excavation. Construction of the sampling stockpiles began on July 14, 1995. By the time actual excavation work began on July 19, 1995, nine sampling stockpiles had been constructed. The sampling stockpiles were constructed as follows: an area approximately 30-feet by 30-feet was scraped or excavated to a depth of 12-inches; a layer of geotextile fabric was placed over the bottom of the excavation; a sheet of visqueen was positioned over the top of the geofabric, and lapped out over the sides of the excavation; and the excavated soil was replaced. As worked progressed, additional sampling stockpiles were added. On July 24, 1995, stockpile number 10 was erected. On July 25, 1995 stockpiles number 11 and number 12 were established. On July 31, 1995 sampling stockpiles number 13 and number 14 were built. Finally, on August 8, 1995, sampling stockpiles number 15 and number 16 were built.

During the construction of some of the sampling stockpiles, the field crew encountered surface staining. This consisted of soil that appeared to be oily or burned. Initially, the worst of the stained soil was removed and placed in the Dangerous Waste stockpile. However, due to impacts on the logistics and sequencing of the other field activities, a decision was made to construct the sampling stockpiles as originally planned, with testing and any necessary cleanup of the existing soils to be conducted during the demobilization phase. The areas exhibiting this type of surface staining were beneath sampling stockpile numbers 7, 10, and 11.

In addition to the construction of the sampling stockpiles, pre-excavation operations required the removal of drums, debris, and containers from the surface of the BDA. Woodward-Clyde crews relocated an open-topped green skid from the BDA area, and removed the drums placed inside it to the drum storage cell. Additionally, another 9 drums of waste from previous investigations were removed from the BDA to the drum storage cell.

Excavation operations into the BDA began on July 19, 1995, at the extreme southwest corner of the area designated as the BDA. Work was initiated in Level B. Stained soil and drum fragments were encountered almost immediately. It was determined that the contamination extended beyond the understood boundary of the BDA toward the southwest. This required that the excavation remove additional soils in that direction, eventually removing the access road near the south boundary of the site, but stopped short of the south perimeter fence.

The following day the excavation crew encountered the first intact buried container (i.e., drum) that contained product. Readings taken with the OVM indicated the presence of organic vapors in the area of the excavation and drum recovery. The drum was placed into an 85-gallon overpack drum. The overpack was labeled and moved to the drum storage area. As excavation continued over the extent of the BDA, additional drums and other containers were removed and placed into 85-gallon overpacks. Each was labeled, cataloged, and moved to the drum storage cell. The placement of the drums into the overpacks was accomplished by lifting the original drum with a chain attached with two visegrips, and lowering the drum into the overpack. In many instances, the uncovered drums were badly deformed, and the excavator utilized the thumb attachment to squeeze the original drum into a shape that would fit into the overpack. The drum removal and overpacking operation was performed over a sheet of visqueen. This was done to prevent the gross contamination of any exposed soil surfaces in the area, since most of the drums were in poor condition, and many leaked immediately upon lifting from the ground. In total, 166 drums were recovered and overpacked during the excavation operation.

In addition to the drums discovered during the excavation operation, an area of discarded paint cans was encountered. These containers, varying in size from 1 pint to 5 gallons, were first encountered on August 8, 1995, and continued to be discovered for several days thereafter. A total of 18 overpacks were filled with waste paint containers.

On August 10, 1995, excavation operations began to uncover 1.5-liter clear graduated glass bottles of a clear liquid. Many of these bottles were still sealed. The field crew removed these bottles from the excavation and from the sampling stockpiles as they appeared, and collected them at several points around the work area. A field hazard categorization performed on the bottle contents failed to demonstrate any hazardous characteristics, and so the bottles were blended into the MTCA soil left on-site.

Excavation of the BDA soils was performed starting at the southwest corner, thereafter moving generally east across the site. Care was taken to segregate soils that appeared stained from those that appeared clean. Also, as much debris as possible was removed at the point of excavation. The debris was staged near the excavation, and later moved into one of several 40-cy roll-off containers. As each truck was filled from the excavation, it moved the excavated soil to a sampling stockpile pre-designated as probable contaminated soil, to a stockpile of possibly contaminated soil, or to a stockpile thought to be free of contamination. As the project progressed, and the analytical data indicated that most soils were contaminated with low levels of PCB's, segregation was limited to two types: suspected clean or suspected contaminated.

Prior to soil being moved to a sampling stockpile, the stockpile area was prepared by laying down a layer of visqueen over the surface. This was to act as a visible barrier during subsequent removal of the soil from the sampling stockpile, and to provide some degree of protection to the underlying "clean" soil. As a truckload of soil was dumped into the sampling stockpile, the field sampling technician collected the required grab samples. Ten truckloads of soil were moved into each sampling stockpile to create a discreet soil management unit of approximately 100 cubic yards. The sampling stockpile was then covered with a sheet of visqueen at the end of the day, and remain covered until disposition of the soil had been determined.

Due to the large number of containers and drums frequently uncovered during the excavation operation, and the presence of volatile organic vapors in association with many of the drums and containers, it was necessary to perform the entire excavation operation in Level B personnel protection. Personal air samples were collected during the first 4 days of operation. Samples were collected from the crew members working in the excavation with the greatest exposure potential to fugitive vapors and dust, from the excavator operator, from inside the cabs of the dump trucks, and from the work area contiguous to the excavation and soil moving operation. Both particulate and organic vapor samples were collected. Analyses performed on the collected samples indicated a general lack of exposure potential. However, there were some samples that indicated the presence of vapors. The air monitoring supported the continued use of air purifying respirators in the general work area, and the use of supplied air systems at the point of excavation (copies of the personal air monitoring reports prepared by Marine and Environmental Testing are included in Volume II).

As the excavation and drum recovery operation progressed eastward, the BDA was excavated to a depth necessary to meet performance standards. The overall depth of the excavation varied from a minimum of 2-feet, to a maximum of 8-feet. The lateral extent of the excavation was stopped when the IRM cap was encountered just inside the anticipated easterly BDA boundary. The initial excavation of the BDA was completed on August 21, 1995. At this point, a total of 7,800 cy had been removed from the excavation in 23 working days (one day was lost to weather). The average production was 339 cy per day.

Excavation operations were renewed upon receipt of verification analyses data. Several grids inside the BDA were found to still contain contamination above established clean-up levels. Four bottom grids and two wall sections were re-excavated and re-sampled until clean-up goals had been met. However, verification grid number 6 proved especially difficult. This area was re-excavated a number of times over the course of 5 days. By the time a halt was called to the excavation in the grid, the depth in that area was approximately 22 feet below the grade of the bottom of the BDA excavation. In total, another 1,780 cy were removed during excavation of the contaminated grids, bringing the total volume of the excavation to 9,580 cy. This activity was completed on August 30, 1995.

2.2.8 Field Sampling and Field Screening

A systematic approach was used to track field samples. For example, sample number BDA95V01 would represent the first verification sample. Similarly, sample number BDA95P0302 would represent the second interim stockpile sample from stockpile number 03.

Sample tracking consisted of several steps. The field sampler filled out a Field Sampling Form, which identifies and describes the geology of the sample material, documents the date and time of sample collection, and notes any organic vapor readings. The sample was transferred from the field sampler to the field laboratory using the Sample Tracking Form. All field laboratory results were recorded on this form. If the field laboratory results were below the MTCA criteria, the sample could be disposed of and no further forms would be needed to track the sample. If the sample was above MTCA criteria, the sample was sent to Laucks Testing Laboratories using a standard Woodward-Clyde Chain-of-Custody Form.

After collection, samples were stored in a field laboratory refrigerator while awaiting screening results. If the sample was sent to Laucks, it was packed in a hard-sided cooler with blue ice and sealed with signed and dated Chain-of-Custody seals. An outside courier service picked up the cooler and delivered it the laboratory.

2.2.8.1 Interim Stockpile Samples

The material excavated from the BDA was placed in a 10 cy dump truck and transported to the appropriate sampling stockpile. The excavated material was unloaded at the sampling stockpile site and five subsamples were collected. The 10 cy pile was then pushed back to ensure that the next 10 cy of soil dumped was not mixed before it was sampled. This procedure was followed for each dump truck load that was placed in the sampling stockpile. The sample was collected in a stainless steel sampling bowl and screened through a 10-mesh sieve. When the sampling stockpile was full (10 dump truck loads), a sample consisting of five subsamples from each 10 cy pile, was thoroughly mixed and a portion placed in a 16-ounce. glass jar.

Samples were screened for PCBs, PAHs, and total metals (As, Cd, Cr, and Pb) in the field laboratory. If the field screening results were above the MTCA criteria, then the sample was sent off-site for laboratory analysis. Field and laboratory sample results for the interim stockpile soil samples are presented in Table 2-1.

2.2.8.2 Verification Samples

A grid was developed using the procedure documented in a memo from Woodward-Clyde to the Boeing Company dated August 15, 1995. The grid included the sides and bottom of the BDA excavation (see Figure 2-5). After the removal of suspect soils and material from the excavation, 37 composite samples were collected. A composite sample consisted of five subsamples, one subsample from the center and one subsample from each of the four corners of the grid. The sample was collected in a stainless steel sampling bowl and screened through a 10-mesh sieve. Sample material was thoroughly mixed before a portion placed in a 16-ounce glass jar.

Samples were sent to Laucks Testing Laboratory for PCB, PAH, and total metals (As, Cd, Cr III, Cr VI, and Pb) analysis. If the laboratory results were above the MTCA criteria, the grid area was further excavated to a sampling stockpile. The grid area was then re-sampled as described above and the re-sample sent to Laucks Testing Laboratory for analysis. Field and laboratory sample results for the verification soil samples are presented in Table 2-2.

2.2.8.3 Demobilization Samples

Upon completion of the excavation and removal of the interim sampling stockpiles, demobilization samples were collected from underneath the interim sampling stockpiles and roadways. Each interim sampling stockpile was assigned a demobilization sampling number. Approximately 100-feet of road was measured and assigned a demobilization sampling number until all areas within the exclusion zone had been assigned a demobilization sampling number. Five subsamples were collected, one from the center and one from each corner of the former stockpile or road area. The sample material was collected in a stainless steel sampling bowl and screened through a 10-mesh sieve. Sample material was thoroughly mixed and a portion placed in a glass jar or ziplock bag for screening.

Areas in the exclusion zone where Dangerous Waste had been stored were sampled and screened for PCBs at a 10-parts-per-million (ppm) detection limit. Areas with screening results greater than 10 ppm PCBs were scraped and the soil was moved to a sampling stockpile for sampling and analysis as described in Interim Stockpile Sampling. Areas with screening results less than 10 ppm PCBs were scraped approximately 6 inches and the soil was moved directly to the MTCA stockpile. The scraped areas were sampled again and screened at the MTCA criteria levels. If the results were less than MTCA criteria, no further action was necessary, if the results were MTCA then the area was re-scraped, re-sampled and re-analyzed in the field laboratory until the areas were below MTCA criteria.

Samples were screened for PCBs, PAHs, and total metals (As, Cd, Cr, and Pb) in the field laboratory. If the field screening results were above the on-site management criteria, then the demobilization stockpile or area was re-scraped, re-sampled and re-analyzed in the field laboratory. Field screening results for the demobilization soil samples are presented in Table 2-3.

2.2.8.4 Field Sampling and Screening

Field screening was performed using the Spectrace 9000 portable X-ray Fluorescence Analyzer (XRF), Hach Chromium VI Test Kits and Ensys Immunoassay Test Kits. The XRF screened samples for the requested total metals (arsenic 20 mg/kg, cadmium 80 mg/kg, total chromium 400 mg/kg and lead 250 mg/kg) and achieved the requested detection limits. Samples were dried before analysis with the XRF. Only one sample had total chromium screening results near 400 mg/kg. The sample was then screened for hexavalent chromium using a Hach test kit. The Ensys test kits screened samples for PCBs (1 mg/kg) and PAHs (1 mg/kg). Samples were prepared and analyzed according to the manufacturer's standard operating procedure with one exception which is discussed in Section 3.2.7. Field screening results were documented on the Sample Tracking Form and are summarized in Tables 2-1 through 2-3.

Field screening also included air monitoring for organic vapors and suspended particles (dust), using a PID and a Mini Ram dust monitor. Air monitoring results were documented in the Field Sampling Form and they are presented in Volume II.

2.2.9 Laboratory Analysis

Samples requiring off-site laboratory analysis were sent to Laucks Testing Laboratories, Seattle, Washington. Samples were analyzed for PCBs by EPA Method 8080, PAHs by EPA Method 8270, Toxic Characteristic Leaching Procedure (TCLP) metals by EPA Method 1311/6010, total metals by EPA Method 6010, and total chromium VI by EPA Method 6010.

Sample duplicates and rinsate blanks were sent to the laboratory at a rate of 1 in 10. Split samples were collected and delivered to a Boeing representative at a rate of 1 in 10.

2.2.10 Stockpile and Store Highly Contaminated Materials

Pre-excavation operations relating to the highly contaminated materials on-site consisted of the construction of two unique storage cells (see Figure 2-6). The first was a 50-feet by 100-feet cell designed for the storage of soils determined to be Dangerous Waste soils. The second was a 40-feet by 60-feet cell designated to store any drums created during the BDA excavation operation. The construction of both cells was similar. First, each area was cleared and graded by the 750 Dozer. The bottom of the cells was made as level as possible, with the entire cell sloping toward one of the four corners, to facilitate drainage. At this point any intrusive debris (metal, plant roots, larger rocks, etc.) was removed. Berms were constructed at the perimeter of each cell. For the drum storage cell, the perimeter berm was about 12-inches high. For the Dangerous Waste cell, the berm was approximately 36-inches high. Then a layer of non-woven geotextile fabric was placed over the entire area, over the berms, and down into a trench on the outside of the berm. Once the fabric was in place, a single piece of 20-mil High Density Polyethylene (HDPE) was placed on the cell, over the berms, and down into the perimeter trench. The trenches were then filled, thereby "keying" in the geo-fabric and the HDPE liner. After the cells were complete, ramps were built into each one using clean soil from around the cell construction area. Construction of the cells began on July 12, 1995, with the grading of the areas, and was completed on July 17, 1995, with the installation of the HDPE liners.

The handling of highly contaminated materials at the site had three distinct operations: 1) the handling of soils determined to be contaminated at Dangerous Waste levels; 2) the collection and storage of contaminated debris; and 3) the packaging, storage, sampling, and categorization of the unearthed drums and containers. The first operation included the disposition of three sampling stockpiles determined to be contaminated with PCB at levels defining the soil as a Dangerous Waste. The third operation included the handling of the overpack drums created by the excavation operation, the staging of the drums inside the drum storage cell and the Dangerous Waste soil storage cell, the sampling of the drums, field hazard categorization of the samples, the creation of composite waste streams of the drummed waste, collection of composite waste stream samples, analyses of the waste stream samples, and the characterization and profiling of the drummed waste for disposal off-site.

All of the Dangerous Waste soil encountered was excavated on the same day (July 31, 1995) from the same general area of the BDA. This soil filled three different sampling stockpiles (05-02, 06-02 and 11-02). The samples collected from all three stockpiles field-screened positive for the presence of PCB above site action levels, and this was then defined by off-site laboratory analysis as being above 100 ppm total PCB. At this time, Woodward-Clyde constructed a "Segregation Area" for attempting to further define the Dangerous Waste soils. This area was constructed identical to the sampling stockpiles, only wider to accommodate four separate piles. Stockpile 05-02 tested the closest to the 100 ppm threshold (110 ppm), and so it was chosen for the segregation effort. The soil from sampling stockpile 05-02 was moved into the segregation area in four separate piles. Each pile was sampled separately, and the samples sent off-site for laboratory analysis. Three of the four samples tested just above the 100 ppm level for PCB's, keeping them designated as Dangerous Waste, while the fourth sample was just below this level and therefore was re-classified as MTCA soil. The consistency of the sample results from these four stockpiles as compared with the initial analytical results of the single stockpile suggest the sampling protocol was effectively generating true composite. Thus, no further segregation and re-testing of Dangerous Waste stockpiles was performed.

The off-site disposal of the Dangerous Waste soils was undertaken by Woodward-Clyde. Boeing had obtained waste profile approvals from the ESI disposal facility in Grandview, Idaho. Loading of waste for disposal by truck began on September 11, 1995, and was completed on September 18, 1995. The load out operation began with the empty transport trucks (end-dump truck type) going to Cedar Grove Composting to obtain an empty tare weight. They then arrived at the site, and the bed of the truck would be lined. After lining, the truck was filled with contaminated debris and Dangerous Waste soil. The truck then returned to Cedar Grove to be re-weighed to determine if the load was legal. In total, 27 trucks were loaded out with debris and soil. This consisted of approximately 275 cy of Dangerous Waste soils, and 190 cy of contaminated debris, which scaled to a weight of 620 tons. Copies of the manifests and certificates of disposal are attached in Volume II.

Due to the consistent PCB contaminant concentration found in the soil, a determination was made to consider all debris to be likewise contaminated due to its contact with the soil. The contaminated debris was collected at the point of excavation throughout the excavation operation. This was performed by either the ground crews separating the debris from the soil inside the excavation, or by the excavator. The excavator used the hydraulic "thumb" attached to the bucket to pick the debris from the excavation and set it aside. Most often both worked in concert, with the ground crew identifying debris for the excavator to remove. This coordinated effort was especially important to ensure that drums containing product were identified by the ground crew as such, and not accidentally picked out by the excavator, thereby releasing the drum contents into the excavation. In order to maintain this coordination, both ground crew and the excavator operators used handheld radios to communicate. Additionally, field crews picked debris from the sampling stockpiles and from the MTCA storage cells as they encountered it. Drum debris and other contaminated material collected from the excavation and from the stockpiled soil was placed into roll-off boxes. Two of these boxes were open-topped, one of which was a metal skid left on-site by previous operations, and the second a 30 cy dump site mobilized to site to hold non-contaminated debris. Four containers were 40- cy hazardous waste roll-offs with collapsible tops. By the end of the project, approximately 190 cy of contaminated debris had been collected. It was blended into the Dangerous Waste soil and transported to ESI for disposal.

The management of the unearthed drums and containers involved the following steps:

a) As a drum was encountered, the ground crew and the excavator operator freed it from the surrounding soil, lifted it by means of a chain wrapped around the lifting eye of the Excavator bucket and attached to the drum with dual visegrips, and lowered it into an 85-gallon overpack;

b) The hydraulic thumb on the excavator used to re-shape the recovered drum, as necessary;

c) The drums or containers were placed into the overpack drums at the place of discovery (multiple containers were sometimes placed into a single overpack);

d) The lids to the overpacks were secured while still in the excavation.;

e) The overpack drums had labels affixed to them giving each a sequential number and listing the date that it was found;

f) The overpacks were moved from the area of the excavation into the drum storage cell, where they were staged on pallets.

After the drum storage cell was filled, drums were placed into the far east end of the Dangerous Waste soil storage cell. During the first few days of the operation, drum moving was accomplished with a Bobcat Loader with a drum grappler attached, and later by means of a 15 ton boom truck. After the drums were placed into the drum storage or Dangerous Waste storage cell, they were covered by a sheet of HDPE.

After completion of the BDA excavation, a total of 204 drums were staged in the drum storage and Dangerous Waste storage cells. Of these, approximately 20 were wastes derived from previous investigations, 18 were overpacks filled with paint cans, and the balance were recovered drums inside overpacks. The waste was characterized in the drums to facilitate eventual disposal off-site. The first step in this process was the collection of samples from each of the drums for field hazard categorization. Field crews opened each of the drums, collected a small sample of the material contained within the drum, and affixed a new tracking label to the overpack. Collection of the individual drum samples was performed on August 21, 22, and 23, 1995.

After all the samples were collected, field hazard categorization testing was performed. Each sample was described as to physical and chemical properties, and the information was entered into the sample tracking computer.

After completion of the hazard categorization, composite samples were collected from each identified waste stream. This required the collection of new samples from each drum, and the compositing of those samples to represent the entire set of drums within that waste stream. Concurrent with this operation, the drums were all physically moved inside the two cells and staged in their waste stream categories. At this time, eleven of the 85-gallon overpacks were re-packaged inside 110-gallon overpacks. This was necessary due to damage of those 85-gallon drums during the initial drum recovery operation. The collection of the composite samples was accomplished on August 30, 31, and September 1, 1995. On September 1, 1995 12 composite samples were forwarded to Laucks Testing Labs for analytical work. From that data, the verification of waste stream categorization was accomplished, as well as the waste stream profiling necessary to dispose of the drums at off-site facilities. The moving of the drums into their waste streams and re-packaging of the 11 damaged overpacks occurred at various times from August 31, 1995, until September 11, 1995. Figure 2-7 shows the location of the waste streams inside the two storage cells.

2.2.11 Stockpile and Store Marginally Contaminated Soils

The pre-excavation activities associated with the stockpiling and covering of the marginally contaminated ("MTCA") soils consisted of the construction of the storage cell into which the MTCA soils were to be staged and stored. This cell was constructed in the large level area at the western end of the site. Construction began with the removal of the vegetation over the area by the 750 Dozer. This removal of vegetation also acted to perform any final grade improvements needed. A berm was constructed around the perimeter of the cell, and a trench excavated. The entire area, including the berm and the inside of the trench, were then covered with a layer of 8-ounce, non-woven geotextile fabric. The material was overlapped 2-feet as needed to cover the cell. After placement of the fabric, a liner of 20-mil HDPE was placed over the cell. The liner was laid over the top of the berm, and down into the trench. The trench was then backfilled, thereby "keying in" the liner and geotextile fabric. The interior dimension of the MTCA cell was approximately 75-feet by 180-feet, with a 36-inch high berm around the perimeter. After the cell was constructed, a ramp into the cell was built at the far east side of the cell. The ramp was built with clean soil collected from around the work site. A 20-mil HDPE cover was positioned at the MTCA cell to cover soils once material storage inside the cell had commenced.

As sampling stockpiles were confirmed to be contaminated at levels requiring on-site management, they were moved into the MTCA soil storage cell. Each sampling stockpile was loaded into the 10 cy dump trucks by the 644 Loader, and the trucks transported the soil into the cell. As soil collected in the cell, it was pushed and graded to form a uniform stockpile. This was accomplished by the 644 Loader at first, so that the rubber tired vehicle would not damage the cell liner. After the first "lift" of

MTCA soil had been placed across the inside of the cell, it was possible to move the 690 Excavator onto the cell to assist in consolidating the stockpile. As space inside the cell became more limited, a John Deere 650 Dozer was used to push and consolidate the soils. The MTCA storage stockpile was covered at the end of each day with the 20-mil HDPE cover.

As the project progressed, the volume of MTCA soils increased beyond the capacity of the storage cell. The stockpile inside the cell had been worked to a pile approximately 20 feet high, and space could no longer be made in the cell. On August 18, 1995, the MTCA storage cell was widened approximately 30-feet across the entire 180-foot length to accommodate all the MTCA soils. This expansion was constructed in the same fashion as the original cell, with the geotextile fabric being placed under the 20-mil HDPE liner, and over a 36-inch berm that went around the perimeter. The existing berm was not taken apart, but rather incorporated into the MTCA stockpile. The extension liner was overlapped over the original berm, and slightly down into the cell. This approximately 4-to-5-foot overlap offered substantial protection against material leaching through down into the underlying soils.

Placement of MTCA soils from the BDA continued until September 1, 1995. At this point, the site activities focused on the cleanup of the site and dismantling of the sampling stockpiles. The site was sectioned off into demobilization grids that were sampled to determine whether they exhibited contamination above site action levels. Each work area grid was sampled and field-screened for PCB at 10 ppm. This was done to ensure that all soils placed into the MTCA cell were at levels allowed for on-site management. Once field screening confirmed that contamination did not exist above 10 ppm, the road sections were excavated and the soils moved directly to the MTCA cell. Sampling stockpiles that had held only MTCA level soils were cleaned and the material removed directly into the MTCA storage cell. The three sampling stockpiles that had held the Dangerous Waste soils, along with the segregation area, were also sampled and screened for PCB at 10 ppm. All were found to be below that level and were excavated directly into the MTCA cell. In total, another 1,590 cy of MTCA level soils were generated through site clean-up activities.

After the completion of site clean-up excavation, the MTCA cell was secured. A 40-foot-wide extension was added to the original cover to accommodate the added width of the cell. This extension was first attached by means of seaming tape provided by the manufacturer. However, due to the steep angle of the stockpile at the seam, the weight of the extension pulled the seam open. The cover extension was then installed by keying the extension piece into the MTCA soil stockpile, and overlapping the original cover onto it. The original cover was then affixed to the extension by means of the seaming tape and ultimately secured with sand bags.

2.2.12 Backfill and Compact Uncontaminated Soils

During the BDA excavation operation, 2,100 cy of soil was determined to be free of contamination above action levels. This soil was stockpiled in an area cleared during the clearing and grubbing operation to the northwest of the BDA (see Figure 2-6). As the clean soil was stockpiled, it was pushed up into a higher pile by the 650 Dozer, thereby maximizing storage space. Additionally, the field crew was regularly inspected the stockpiled soil and remove as much debris (organic matter, bottles, rubbish, pieces of ferrous waste, etc.) from the soil as possible.

The first backfilling operation performed on the project did not involve any excavated material. On July 28 and 29, 1995, the roadway at the far southwest corner of the BDA was restored. This area, outside the understood boundaries of the BDA, had been excavated due to the presence of contamination under the roadway. This roadway was needed for on-site travel, so the decision was made to collect a verification sample from the area and, if found free of contamination, restore the roadway. The backfill material used to restore the road was from a clean stockpile of material found northeast of the IRM, near the site trailers. Approximately 300 cy was moved into the area to re-build the road.

Originally, the clean excavated soil had been targeted for use as part of a general backfilling of the BDA excavation. This plan was later modified to eliminate the complete backfill of the BDA excavation with a plan to partially backfill the lowest points of the excavated area to allow drainage, along with re-constructing roadways to allow for travel on-site. The first use of clean excavated material occurred on August 22, 1995. On that date, re-excavation driven by verification sampling had removed the access road to the west of the BDA and effectively eliminated the access route to the MTCA and clean soils storage areas. Clean excavated material used to construct a new roadway across the BDA at the western end of the excavation. Two sampling stockpiles (08-06 and 11-04) were moved into the BDA directly after being screened free of contamination. An additional 11 truckloads were taken from the clean soil stockpile to complete the new access roadway. Compaction of the backfill was accomplished by means of rolling over the fill with the 650 Dozer and 10-cy dump trucks.

The second application of clean excavated material took place on August 30, 1995, following the direction to backfill the excavation of verification grid number 6. That grid section had been excavated to a depth of approximately 22-feet below that of the balance of the BDA excavation bottom. Ninety truckloads (approximately 900 cy) of clean excavated soil was placed into the grid number 6 excavation to bring it back to grade with the rest of the excavated BDA. Compaction was achieved with on-site construction equipment.

The balance of the clean excavated soil (approximately 900 cy) was used at the west side of the BDA to fill in the area between the newly constructed access road, promoting drainage from the western side of the BDA toward the north.

2.2.13 Import, Backfill, and Compact Additional Fill

Due to the change in backfill strategy, the need for imported backfill was eliminated. As such, no imported material was brought to the site.

2.2.14 Site Restoration

Site restoration activities began on July 28, 1995, with the reconstruction of the south boundary access road where it crossed over the BDA. This section of roadway had been removed due to underlying contamination, and its restoration was necessary to allow for material movement and general travel on-site.

Other site restoration work was initiated after the completion of the initial excavation and verification-driven re-excavation of the BDA. Woodward-Clyde established a sampling grid over the entire work area to establish the level of contamination, if any, over each discrete area. In total, 33 sections were established over the work area (see Figure 2-8). Road or work areas of approximately 100-feet in length were established as grids. Each road section was then sampled and screened at 10 ppm for PCB's since PCB was the only site contaminant that had ever exceeded Dangerous Waste levels. Once it had been established that PCB concentrations did not exceed 10 ppm, it was possible to excavate all soils across the work area and move the excavated material directly to the MTCA soil storage cell. Sampling stockpiles numbers 05, 06, and 11, along with the segregation area were also sampled and field-screened below 10 ppm. (These stockpiles had held the Dangerous Waste soils).

After excavation of each grid, a composite sample was collected. Five samples were collected from the grid - one from each corner, and one from the center. These were then field-screened for all site target contaminants at clean-up levels. Every work area demobilization grid section was cleaned to below BDA action levels. Excavation of the work area grids began on August 25, 1995, and was completed on September 8, 1995. In total, 1,590 cy were moved from the work area surface and taken to the MTCA storage cell.

After completion of the work area excavation/cleanup, the area was graded and the site roads restored. Road restoration was accomplished through replacing of the roads to eliminate the effects of heavy equipment operation.. This was followed by an application of 1-1/4-inch-minus crushed rock. The crushed rock was placed about 3 to 4 inches deep, and evenly spread across the road surface. In some cases, existing roads were re-graded, but did not require the addition of crushed rock surfacing. In addition to the restoration of existing roads, several new roads were established. A road was built along the northeastern corner of the BDA to restore access to the IRM area from the area north of the BDA. Roadways at the northern side of the work area, in the zone cleared and grubbed by Woodward-Clyde, were added and improved to allow turn-around for future vehicle and equipment travel.

2.2.15 Demobilization

Demobilization of equipment occurred throughout the duration of the project. As a piece of equipment was no longer needed, it was decontaminated and removed from site. The 750 Dozer was demobilized on July 14, 1995. Since it had not encountered or worked in any contaminated material, its decontamination was minimal. A 10-cy dump truck was demobilized on July 19, 1995. It had some contact with contaminated soil, so it had a more thorough decontamination, including a complete wash of the truck bed. The Bobcat Loader was sent off-site on July 26, 1995. It too had contact with contaminated materials, and was thoroughly steam cleaned.

The remaining heavy equipment was demobilized at or near the end of the project. Each piece underwent the same, complete decontamination prior to shipment off-site. The 40-cy roll-off boxes were decontaminated prior to shipment off-site. The three primary pieces used to work the contaminated soil, the 690 Excavator, the 644 Loader, and the 650 Dozer, also had their air filters removed to prevent any off-site personnel from coming into contact with site contamination.

Demobilization of site support facilities and services went as expected. Power and telephone communications were disconnected on September 21, 1995. The Woodward-Clyde site operations trailer was removed on September 22. The site support/utility trailer was removed on September 20, 1995. All demobilization functions were completed by September 22, 1995 (see Figure 2-8).

2.2.16 Closure Report

This report satisfies the EPA guidance *Remedial Action Report, Documentation for Operable Unit Completion,* (1992).

2.2.17 Project Vehicles

Woodward-Clyde utilized one (1) passenger van and two (2) 1-ton flatbed trucks during the course of the project. For a period at the end of the project, one of the flatbed trucks was replaced by a 3/4-ton pick-up.

2.2.18 Other

The site support efforts performed by Woodward-Clyde included the staffing of the project with a full-time Site Supervisor and staff scientist/cost accountant. The Site Supervisor directed all fieldwork, planned the work tasks and decided work methods to be employed, oversaw health and safety for all personnel and subcontractors on-site, produced site reports, interacted with Boeing management on-site, and performed all other management duties necessary to ensure the smooth performance of the work. The staff scientist/cost accountant tracked all project costs on-site and reported this information to the site manager. This individual was also responsible for tracking all samples and associated analytical data for the work performed. She also assisted in the performance of the field screening laboratory duties, and sample collection in the field.

Other site support function included the employment of Marine and Environmental Testing to perform personal air monitoring during the first 4 days' operations. The Certified Industrial Hygienist (CIH) collected both particulate and organic vapor samples from the ground crew working at the point of excavation, the excavator operator, from inside the dump truck cabs, and from the general area around the work. Results of the monitoring indicated the presence of some contaminants in the breathing zone but not at levels that exceeded the performance of the PPE being utilized (copies of air monitoring reports included in Volume II).

Additional tasks were added to the site support function during the course of the project. A site control fence was erected at the boundary of the support zone on top of the IRM to designate the work areas on-site. Approximately 700 feet of 48-inch orange barricade fence was erected across the support zone/contamination reduction zone boundary. A 21,000 gallon Baker Tank was mobilized to the site to hold water generated from the collection of precipitation from the holding cells, and for decontamination water generated during the course of the BDA excavation project. This tank was stationed contiguous to the permanent decontamination station.

2.3 PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

Performance standards are the criteria or requirements must be met in completing the project and they include cleanup levels, quality criteria, and other substantive requirements, or limitations found in the ROD. Each relevant performance standard is addressed below by providing the standard, the maximum level permissible, the results of the field sampling, the basis for determination that the standard was met, and the location and frequency of the tests.

As specified in the CD and the ROD, the objectives of the BDA excavation element of the RA are to permanently remove and treat the BDA debris, and permanently control the mobility of any residual contaminants remaining after excavation and removal of the primary debris source. The performance standards to be met for this element of the overall RA include:

1. Soil left in place must be below the concentration levels shown in the first column of the table presented on the next page:

PERFORMANCE STANDARDS FOR BDA SOIL

Concentration/Action Level (a)

Hazardous Substance	In-Pace Management	Management Below Cap	Off Site Disposal
Arsenic	< 20 (b)	> 20 but < 5.0 (TCLP)(c)	> 5.0 (TCLP)
Cadmium	<80 (d)	> 80 but < 1.0 (TCLP)(c)	> 1.0 (TCLP)
Chromium III	< 80,000 (e)	> 80,000 but < 5.0 (TCLP) (c)(f)	> 5.0 (TCLP)
Chromium VI	< 400 (e)	> 400 but < 5.0 (TCLP) (c)(f)	> 5.0 (TCLP)
Lead	< 250 (b)	> 250 but < 5.0 (TCLP)(c)	> 5.0 (TCLP)
PCBs (Total)	< 1.0 (b)	> 1.0 but < 100 (g)	> 100.0
PAHs (carcinogenic)	< 1.0 (b)	> 1.0 but < 100 (g)	> 100.0

a) All units ppm. All criteria are for total concentrations except those identified as TCLP criteria.

b) Taken from Method A cleanup levels as described in "Model Toxics Control Act Cleanup Regulations", Chapter 173-340-WAC.

c) TCLP = Toxic Compound Leachate Procedure which is used for RCRA hazardous waste characterization.

d) Based upon Method B cleanup level using a reference dose for food.

e) Based upon Method B cleanup level.

f) Chromium characteristic is for total chromium in TCLP extract.

g) State-only dangerous waste criterion for carcinogenicity.

2. All soil with contaminant levels below the Washington Dangerous Waste designation levels in effect as of the signing of the ROD (WAC 173-303-070 et seq., set under the WA Hazardous Waste management Act, RCW 70.105) but above the cleanup levels shown in the first column of the table presented above will be consolidated below an expansion of the existing IRM cap.

Contaminant concentrations between the two criteria shown in the second column of the table above must be capped.

3. All soil and debris with contaminant levels above the WA Dangerous Waste designation levels in effect as of the signing of the ROD (shown in column 3 of the above table), shall be removed and segregated for off site treatment and disposal.

Excavation into the BDA began on July 19, 1995. On July 20, 1995 the first buried container (i.e., drum) was encountered. Thereafter, numerous additional drums and other containers were encountered. They were excavated and overpacked, labeled, cataloged and moved to the drum storage cell. At the completion of the fieldwork, all overpacks were transported and disposed of off site.

The initial excavation of the BDA was completed on August 21, 1995, at which time 7,800 cy had been excavated stockpiled and sampled. The results of this sampling and analysis have been presented in Table 2-1. Upon completion of the initial BDA excavation, verification samples were obtained from the bottom and sides of the excavation. As a result of the verification sampling and analysis (see Table 2-2), four bottom grids and 2 wall grids were re-excavated and resampled until cleanup goals were achieved.

In only one instance (verification grid #6), was the excavation halted without meeting the performance standards. When the excavation had reached a depth exceeding 22 feet, the EPA on site representative was consulted and permission to close the excavation was granted. The additional excavation as a result of the verification sampling and analysis yielded another 1,780 cy, bringing the total volume excavated to 9,580 cy. These activities were completed on August 30, 1995.

In conclusion, all soils and debris excavated were handled in compliance with the performance standards as specified in the table presented above with the sole exception of verification grid #6. Of the total volume excavated (9,580 cy), approximately 275 cy of soil were characterized as Dangerous Waste. These soils, along with approximately 190 cy of contaminated debris, were transported and disposed of off site. Approximately 7,200 cy were characterized as marginally contaminated and as such, these soils and debris were stockpiled and secured on site for ultimate relocation under the extension of the existing IRM cap. A total of 2,100 cy were characterized as clean and utilized as backfill in the BDA excavation.

With regard to construction quality control, the Site Supervisor continuously monitored the project schedule and budget including the rate of excavation, field screening data, laboratory turnaround time, and confirmation analysis. Daily work reports including cost estimates were submitted to the designated Boeing representative for review.

The rate of excavation varied from 170 cy per day to 570 cy per day and averaged 339 cy per day. Conditions encountered at the site, including the overpacking and removal of 184 drums, encountering large amounts of miscellaneous debris and continuous Level B working conditions, slowed the progress from the expected daily excavation rate (430 cy per day). The field screening was completed at a rate that met or exceeded the excavation rate. The laboratory turn-around time was not met in many cases. The laboratory was contacted on several occasions about the delays and possible corrective solutions. Of the 91 initial excavation samples, 25 had at least one analysis reported late and nearly every verification sample had at least one analysis reported late. Field screening data were consistent with laboratory data for all confirmation samples.

SECTION 3

3.0 EXPLANATION OF SCOPE MODIFICATIONS/DEVIATIONS

All scope modifications or deviations were discussed in advance with on-site Boeing representatives and approved prior to implementation. Table 3-1 presents a comparison of the proposed schedule milestones versus the actual completion dates.

3.1 PLACEMENT OF MTCA SOILS

The MTCA soils are presently stockpiled in a containment cell made of 20-mil HDPE. The soils will be placed within the vertical barrier wall alignment and under the cap expansion by the barrier wall contractor. This work will be performed in 1996.

3.2 DISPOSAL OF CONTAINERIZED WASTE

An additional scope of work requested of the Woodward Clyde/CET team was to Hazard Categorize (HAZCAT) the waste contained in overpacks. This information was then used to generate profiles necessary for off-site waste disposal. Disposal will be handled by Boeing and disposition records will be presented as an addendum to this report.

3.3 LEVEL B PERSONAL PROTECTIVE EQUIPMENT

It was initially anticipated that a downgrade from Level B Personal Protective Equipment (PPE) would likely be possible following the preliminary excavation and monitoring activities. However, due to the large number of containers encountered during the excavation and the unknown character of the material found inside the containers, it was necessary to perform nearly all of the excavation and container removal operation in Level B PPE. This required providing supplied breathing air to the operator of the excavator and the two field crew members in the excavation whose job it was to identify, handle, and re-package any unearthed containers found to contain product. Additionally, Level B PPE was utilized during the sampling of the recovered containers during the field hazard categorization operation.

3.4 SAMPLING STOCKPILES

Several changes were made to the design of the soil sampling stockpiles primarily to improve work performance and environmental protection. The stockpile base was excavated to a depth of 12 inches rather than 6 inches to better protect the underlying plastic sheet and geotextile fabric. The original 6 inch cover appeared to be inadequate to provide protection during soil moving operations. Also, during the construction of the sampling stockpiles, it became clear that more room would be needed to physically fit the planned 12 to 15 stockpiles into the work area. It was necessary to increase the size of this area to accommodate the eventual total of 16 stockpiles necessary to keep up with production rates and sampling turn-around times. The final item affecting the stockpile construction was the discovery of stained soils outside the BDA in the designated stockpile work area. Minor modifications were initially made to deal with this discovery, with final cleanup and verification testing being done during the demobilization phase.

3.5 EXCAVATION TECHNIQUE

Since more containers were discovered during excavation than anticipated, it was necessary to abandon the plan to excavate the BDA in two lifts. As drum recovery became an inherent part of the excavation operation, the field crew were in a position to either continue to remove drums past the boundary of what would have been the first lift, or to leave drums in place at the surface of the second lift. This second alternate was deemed unacceptable due to the increased exposure potential to personnel and equipment required to work on the surface of the BDA. Additionally, it was apparent that the majority of BDA soils exhibited contamination at levels requiring on-site management (MTCA soils), with very little soil falling into the "clean" classification. Knowing that the surface of what would have been the second lift was likely contaminated at these levels, it would have been imprudent to expose an area of that size to conditions that might lead to the spread of the contamination through weather or site activities.

3.6 SAMPLING TECHNIQUE

The work plan stated that samples would be collected from the bed of the dump truck. It was necessary to modify this approach as it was not practical for the sampling technician. The procedure was changed so that the excavated material was first unloaded at the sampling stockpile. The technician then collected five subsamples from the 10 cubic yard pile. After samples from 10 dump truck loads of excavated material had been collected, the sample material was then thoroughly mixed to produce a single representative sample.

3.7 VERIFICATION SAMPLE GRID

The work plan indicated that the verification sampling grid would be designed according to the EPA guidance document "Verification of PCB Spill Cleanup by Sampling and Analysis" (EPA-56/5/85-026, Aug., 1985) and "Field Manual for Grid Sampling of PCB Spills to Verify Cleanup" (EPA-560/5-86-017, May, 1986). The procedure presented in these documents was for a circular spill pattern and did not turn out to be appropriate for the shape of the BDA. An alternate method was discussed in a meeting with Boeing and approved with concurrence with EPA. Figure 2-5 shows the sampling grid that was designed and used for this project. The grid included 37 samples as originally planned and included both the floor and walls of the BDA.

3.8 DEMOBILIZATION SAMPLING PROCEDURE

The work plan stated that if the demobilization areas (access roads and beneath sampling stockpiles) would be field-screened at MTCA levels (1 PPM for PCB's). Areas which field-screened above this level would be isolated and covered pending results of off-site laboratory analysis. The procedure was modified due to the demonstrated accuracy of the field-screening analysis. The demobilization areas were field-screened at 10 ppm for PCB's. Areas with screening results less than 10 ppm were scraped and the soil was moved directly tot he MTCA stockpile. No attempt was made at this point to differentiate between MTCA soil and clean soil. Following scraping, the areas were then field-screened at 1 ppm for PCB's. If the results were less than this MTCA level, no further action was necessary. If the screening results exceeded MTCA levels, the procedure of scraping, sampling, and analyzing was repeated until all demobilization areas were below the MTCA designation.

3.9 FIELD SCREENING/X-RAY FLUORESCENCE ANALYSIS

Field screening was performed as stated in the work plan except for a few minor modifications. The Ensys PCB test kits were set at a testing level of 1 ppm as opposed to the 0.4 ppm as stated in the TRD. For general PCB screening the testing level is normally set at 1 ppm. The test kits can achieve lower limits for specific arochlors when the contamination is of a known origin.

The XRF standard operating procedure stated that the analysis time for most metals was 200 seconds. The XRF could not achieve the required detection limit for arsenic with a 200-second analysis time. Technical support personnel at Spectrace suggested a 400-second analysis time to achieve our detection limits. All samples were analyzed with the XRF for 400 seconds on each of the three x-ray sources.

3.10 WASTE DEBRIS

The collection of contaminated debris varied from that described in the TRD due to the increase in anticipated volume. The TRD proposed that debris be placed into 85-gallon overpacks for handling, or set aside as non-contaminated for common waste disposal. Since the majority of soil excavated from the BDA exhibited low levels of PCB contamination it was determined that the debris encountered should be designated as dangerous waste due to contact with this soil. Consequently, four 40 cubic yard roll-off boxes were mobilized to temporarily store the debris collected from the excavation. This material was eventually loaded out for off-site disposal along with the Dangerous Waste soil.

3.11 FIELD DISCREPANCIES

The condition most affecting the initial excavation was the discovery of the large quantity of intact drums and containers within the BDA, and the fact that many of these containers held product. Previous site investigations did not indicate that such a large quantity of intact drums nor a variety of waste materials would be encountered. A total of 30 overpacks were originally procured to contain drum fragments and tars anticipated. A total of 184 overpacks were actually used for the wastes discovered.

3.12 MTCA SOIL

Previous site investigations had resulted in conclusion that 60 percent of the excavated soils would be "clean" (free of contamination above action levels) and 40 percent of the soil to be designated as MTCA soils to be managed on-site (with only a minor portion exceeding dangerous waste levels). Actual volumes for these soil designations were 75 percent MTCA and 22 percent "clean". Due to this increase in volume it was necessary to enlarge the MCTA storage cell. The cell was expanded 30 feet in width to a final expanded dimension of 105 feet by 180 feet. The soil was placed in this cell to an average height of over 12 feet.

3.13 MTCA STORAGE CELL

To avoid impacting an existing monitoring well (Y-1), the MTCA soil stockpile was initially reduced in area but increased in height. However, due to the increase in the volume of MTCA soils, it became necessary to expand the stockpile area to nearly the original footprint area. Additional sandbag anchors were applied to the spliced seam on the 20-mil cover to ensure the integrity.

3.14 BACKFILL

The clean soil encountered during the excavation was backfilled as proposed in the TRD, although compaction testing and specialty compaction equipment was not deemed necessary. A decision was made not to import volumes of clean soil for restoration but rather to grade the excavated area to allow for natural drainage to occur. This also eliminated the need to hydroseed as proposed. Final site grading and total site restoration will take place after the barrier wall is constructed and final cap is installed.

3.15 TRUCK YARD VS. BANK YARD SOIL VOLUMES

Truck-yard measurements of soil excavated from the BDA totaled 9,600 cubic yards. Bank yard measurements based on survey points and field data indicated there was a total of 8,823 cubic yards of material removed from the excavation.

SECTION 4

4.0 OBSERVATIONS/RESULTS

Figure 4-1 depicts the site as it was following site restoration and demobilization. The final topography (i.e., grades) are also presented; however, it should be noted that the "final" survey of the BDA grades was performed on August 29, 1995. Minimal additional grading in the vicinity of the BDA was performed during site restoration and demobilization. Figure 4-2 presents the results of a survey of the invert of the BDA immediately following the excavation activities.

SECTION 5

5.0 CERTIFICATION OF COMPLETION

Woodward-Clyde hereby certifies that the QCF Superfund Site BDA excavation RA was performed in compliance with the design criteria as specified in the agency approved TRD (July 25, 1995) and that applicable construction-based performance standards have been met.

Edward J. Rogan

Edward J. Rogan, V.P.
Project Manager

TABLES

BOEING QUEEN CITY FARMS - BURIED DRUM AREA EXCAVATION
SUMMARY OF ESTIMATED FINAL COSTS
TABLE 1-1

PROJECT #: 944057NA
DATE: DECEMBER 6, 1995

ITEM/TASK	W-C				CET			TOTAL	AUTHORIZED BUDGET		
	LABOR	ODCs	SUBs	SUBTOTAL	LABOR	EXP/SUB	SUBTOTAL		ORIG	F.O.'S	TOTAL
1 - MOBILIZATION	0	1,831	0	1,831	2,757	757	3,514	5,345	2,180	1,000	3,180
2 - TRD	25,506	1,326	0	26,832	0	0	0	26,832	13,864	15,000	28,864
3 - SAFETY EQUIP/PPE	0	3,220	0	3,220	0	10,840	10,840	14,060	8,914	3,000	11,914
4 - CLEARING/GRUBBING	0	0	3,815	3,815	1,370	2,471	3,841	7,656	7,383	0	7,383
5 - FENCE REMOVAL	0	0	0	0	672	571	1,243	1,243	1,216	0	1,216
6 - EROSION CONTROL	0	0	0	0	463	433	896	896	2,628	0	2,628
7 - INITIAL EXCAVATION	0	13	0	13	19,403	21,595	40,998	41,011	38,603	0	38,603
8 - FIELD SCREENING	7,571	437	0	8,008	6,338	28,472	34,810	42,818	36,408	0	36,408
9 - LAB ANALYSIS	0	0	80,000	80,000	0	0	0	80,000	83,641	0	83,641
10 - HIGHLY CONTAMINATED	0	0	0	0	10,902	124,957	135,859	135,859	13,000	51,500	64,500
11 - MARGINALLY CONTAMINATED	0	0	0	0	15,128	37,043	52,171	52,171	34,348	0	34,348
12 - UNCONTAMINATED	0	0	0	0	564	3,074	3,638	3,638	16,778	0	16,778
13 - ADDITIONAL FILL	0	0	0	0	0	0	0	0	53,350	-53,350	0
14 - SITE RESTORATION	0	6,847	5,228	12,075	4,918	9,822	14,740	26,815	16,238	4,000	20,238
15 - DEMOBILIZATION	0	294	0	294	1,068	653	1,721	2,015	4,450	0	4,450
16 - CLOSURE REPORT	13,340	1,334	0	14,674	0	0	0	14,674	14,672	0	14,672
17 - VEHICLES	0	2,079	0	2,079	0	4,440	4,440	6,519	4,360	0	4,360
18 - OTHER	60,909	9,391	4,707	75,007	776	11,872	12,648	87,655	39,809	120,500	160,309
(a) TOTAL COST	107,326	26,771	93,750	227,847	64,359	257,000	321,359	549,206	391,842	141,650	533,492

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P01-01	7/20/95	14:30	**>1**	< 1	< 16	39	120	140	--	Confirmation
P01-01 (LAB)			**4.2**	< 1	< 17	8.1	48	110	< 0.22	MTCA
P02-01	7/20/95	10:30	**>1 / >1**	< 1	< 14	< 22	200	93	--	Confirmation
P02-01 (LAB)			**2.4 / 4.6**	0.037/0.052	< 16/< 18	9.1 / 7.1	54 / 38	90 / 62	0.22/<0.2	MTCA
P03-01	7/21/95	10:45	**>1**	< 1	< 12	36	76	26	--	Confirmation
P03-01 (LAB)			**2.3**	< 1	< 19	2.6	30	23	--	MTCA
P04-01	7/20/95	14:30	**>1**	< 1	18	42	280	140	--	Confirmation
P04-01 (LAB)			**3.1**	0.29	< 17	16	52	110	< 0.23	MTCA
P05-01	7/24/95	11:00	**>1**	< 1	< 12	34	130	27	--	PCB only
P05-01 (LAB)			**2.6**	--	--	--	--	--	--	MTCA
P06-01	7/24/95	16:40	**>1**	< 1	< 12	30	230	< 32	--	PCB only
P06-01 (LAB)			**1.5**	--	--	--	--	--	--	MTCA
P07-01	7/24/95	11:00	**>1**	< 1	< 15	< 37	260	71	--	PCB only
P07-01 (LAB)			**3.9**	--	--	--	--	--	--	MTCA
P08-01	7/27/95	10:20	**>1**	**>1**	**49**	27	370	**610**	0.04 mg/L	PCB, PAH, TCLP
P08-01 (LAB)			**13**	**1.8**	< 0.2 mg/L	0.28 mg/L	< 0.1 mg/L	0.28 mg/L	--	MTCA
P09-01	7/21/95	14:15	**>1**	< 1	< 16	26	160	120	--	Confirmation
P09-01 (LAB)			**3.7**	0.23	< 19	13	43	90	--	MTCA
P10-01	7/25/95	14:20	**>1**	< 1	< 20	64	230	**250 / 300**	--	PCB, TCLP
P10-01 (LAB)			**40**	--	< 0.2 mg/L	0.3 mg/L	< 0.1 mg/L	0.14 mg/L	--	MTCA
P11-01	7/25/95	13:55	**>1**	< 1	< 12	< 20	150	22	--	PCB only
P11-01 (LAB)			**1.6**	--	--	--	--	--	--	MTCA
P12-01	7/27/95	14:07	**>1**	< 1	< 12	37	89	33	--	PCB only
P12-01 (LAB)			**8.4**	--	--	--	--	--	--	MTCA
P13-01	8/1/95	9:40	**>1**	< 1	< 14	< 22	< 70	96	--	PCB only
P13-01 (LAB)			**74**	--	--	--	--	--	--	MTCA
P14-01	8/1/95	10:05	**>1**	< 1	< 16	57	200	200	--	PCB only
P14-01 (LAB)			**16**	--	--	--	--	--	--	MTCA

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P15-01	8/8/95	14:00	**>1**	< 1	**45**	< 32	84	330	--	PCB, TCLP
P15-01 (LAB)			**1.7**	--	< 0.2 mg/L	0.19 mg/L	< 0.1 mg/L	0.3 mg/L	--	MTCA
P16-01	8/8/95	16:25	**>1**	< 1	**30**	< 32	118	**340**	--	PCB, TCLP
P16-01 (LAB)			**7.4**	--	<0.2 mg/L	0.17 mg/L	<0.1 mg/L	0.29 mg/L	--	MTCA
P01-02	7/28/95	10:50	**>1**	< 1	<16	<20	270	220	--	PCB only
P01-02 (LAB)			**2.5**	--	--	--	--	--	--	MTCA
P02-02	7/31/95	10:00	**>1**	< 1	**23**	29	190	**255**	--	PCB, TCLP
P02-02 (LAB)			**65**	--	< 0.2 mg/L	0.16 mg/L	< 0.1 mg/L	0.2 mg/L	--	MTCA
P03-02	7/27/95	14:00	**>1**	< 1	< 14	< 22	160	110	--	PCB only
P03-02 (LAB)			**3.6**	--	--	--	--	--	--	MTCA
P04-02	7/27/95	9:10	**>1**	< 1	< 13	< 22	210	68	--	PCB only
P04-02 (LAB)			**5.1**	--	--	--	--	--	--	MTCA
P05-02	7/31/95	11:30	**>1**	< 1	< 16	25	110	140	--	PCB only
P05-02 (LAB)			**110**	--	--	--	--	--	--	**SPLIT**
P05-02 A	8/4/95	11:05	**100**	--	--	--	--	--	--	DW
P05-02 B			**96**	--	--	--	--	--	--	MTCA
P05-02 C			**140**	--	--	--	--	--	--	DW
P05-02 D			**150**	--	--	--	--	--	--	DW
P06-02	7/31/95	11:00	**>1**	< 1	< 20	41	240	**450**	--	PCB, TCLP
P06-02 (LAB)			**290**	--	< 0.2 mg/L	0.29 mg/L	< 0.1 mg/L	0.34 mg/L	--	**HOLD-DW**
P07-02	7/31/95	10:00	**>1**	**>1**	**23**	32	220	**260**	--	PCB, PAH, TCLP
P07-02 (LAB)			**62**	0.95	< 0.2 mg/L	0.22 mg/L	< 0.1 mg/L	0.55 mg/L	--	MTCA
P08-02	8/2/95	16:10	< 1	< 1	18	< 24	< 74	< 14	--	Confirmation
P08-02 (LAB)			0.24	--	--	--	--	--	--	UR
P09-02	7/28/95	10:15	**>1**	**>1**	**23**	< 23	270	**270**	--	PCB, PAH, TCLP
P09-02 (LAB)			**12 / 10**	**1.2 / 0.95**	< 0.2 mg/L	0.22 mg/L	< 0.1 mg/L	0.21 mg/L	--	MTCA
P10-02	8/1/95	11:00	**>1**	< 1	< 14	< 22	165	71	--	PCB only
P10-02 (LAB)			**3.4**	--	--	--	--	--	--	MTCA

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P11-02	7/31/95	10:20	>1	>1	< 16	37	110	200	--	PCB, PAH
P11-02 (LAB)			**210**	**1.4**	--	--	--	--	--	**HOLD-DW**
P12-02	8/2/95	14:40	>1	< 1	< 16	< 22	14	< 20	--	PCB only
P12-02 (LAB)			**6.2**	--	--	--	--	--	--	MTCA
P13-02	8/4/95	13:35	>1	< 1	**32**	28	190	160	--	PCB, TCLP, As
P13-02 (LAB)			0.79	--	5.3 mg/kg	--	--	--	--	UR
			--	--	<0.02 mg/L	0.08 mg/L	< 0.1 mg/L	< 0.1 mg/L	--	UR
P14-02	8/4/95	14:10	>1	< 1	18	44	330	71	--	PCB only
P14-02 (LAB)			**3.9**	--	--	--	--	--	--	MTCA
P15-02	8/14/95	14:10	>1	< 1	11	< 32	< 40	39	--	PCB only
P15-02 (LAB)			0.7	--	--	--	--	--	--	UR
P16-02	8/14/95	15:30	>1	< 1	13	< 30	< 40	44	--	PCB only
P16-02 (LAB)			0.76	--	--	--	--	--	--	UR
P01-03	8/3/95	16:00	>1	< 1	< 20	< 22	290	230	--	PCB only
P01-03 (LAB)			**2.5/2.4**	--	--	--	--	--	--	MTCA
P02-03	8/3/95	15:35	>1	< 1	15	< 22	100	56	--	PCB only
P02-03 (LAB)			**1.04**	--	--	--	--	--	--	MTCA
P03-03	8/1/95	11:45	>1	< 1	< 14	25	160	77	--	PCB only
P03-03 (LAB)			0.96	--	--	--	--	--	--	MTCA
P04-03	8/2/95	10:40	>1	< 1	**24**	30	230	170	--	PCB, TCLP
P04-03 (LAB)			**6.9**	--	< 0.2 mg/L	0.27 mg/L	< 0.1 mg/L	0.22 mg/L	--	MTCA
P05-03	8/4/95	14:45	>1	< 1	18	45	110	76	--	PCB only
P05-03 (LAB)			**4.1**	--	--	--	--	--	--	MTCA
P06-03	8/11/95	14:30	>1	< 1	14	< 32	47	89	--	PCB only
P06-03 (LAB)			**2.5/2.6**	--	--	--	--	--	--	MTCA
P07-03	8/3/95	16:35	>1	< 1	18	< 22	150	35	--	PCB only
P07-03 (LAB)			**3.4**	--	--	--	--	--	--	MTCA

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P08-03	8/10/95	11:30	**>1**	< 1	14	< 32	< 38	91	--	PCB only
P08-03 (LAB)			**4.4**	--	--	--	--	--	--	MTCA
P09-03	8/3/95	10:55	**>1**	< 1	14	< 22	49	106	--	PCB only
P09-03 (LAB)			**3.1**	--	--	--	--	--	--	MTCA
P10-03	8/4/95	15:45	**>1**	< 1	< 17	< 26	< 40	87	--	PCB only
P10-03 (LAB)			**2.8**	--	--	--	--	--	--	MTCA
P11-03	8/11/95	15:15	**>1**	< 1	10	< 34	< 38	18	--	PCB only
P11-03 (LAB)			**1.2**	--	--	--	--	--	--	MTCA
P12-03	8/7/95	16:30	**>1**	< 1	19	< 34	73	120	--	PCB only
P12-03 (LAB)			**1.4**	--	--	--	--	--	--	MTCA
P13-03	8/11/95	11:50	**>1**	< 1	9.9	< 32	< 38	54	--	PCB only
P13-03 (LAB)			**3.8/3.7**	--	--	--	--	--	--	MTCA
P14-03	8/10/95	10:15	**>1**	< 1	14	< 36	290	94	--	PCB only
P14-03 (LAB)			**5**	--	--	--	--	--	--	MTCA
P01-04	8/9/95	16:10	**>1**	< 1	15	< 34	100	99	--	PCB only
P01-04 (LAB)			**28**	--	--	--	--	--	--	MTCA
P02-04	8/9/95	14:30	**>1**	< 1	16	< 34	< 38	15	--	PCB only
P02-04 (LAB)			**6.1**	--	--	--	--	--	--	MTCA
P03-04	8/4/95	16:30	**>1**	< 1	16	< 30	61	140	--	PCB only
P03-04 (LAB)			**9.4**	--	--	--	--	--	--	MTCA
P04-04	8/7/95	15:43	**>1**	< 1	17	< 34	130	95	--	PCB only
P04-04 (LAB)			**2.6**	--	--	--	--	--	--	MTCA
P05-04	8/10/95	15:00	**>1**	< 1	17	< 30	< 40	140	--	PCB only
P05-04 (LAB)			**2.1**	--	--	--	--	--	--	MTCA
P06-04	8/21/95	15:50	**>1**	< 1	12	< 34	< 36	54	--	PCB only
P06-04 (LAB)			**4.1 / 3.4**	--	--	--	--	--	--	MTCA
P07-04	8/9/95	15:10	**>1**	< 1	16	< 34	< 42	130	--	PCB only
P07-04 (LAB)			**3.4**	--	--	--	--	--	--	MTCA
P08-04	8/15/95	11:45	< 1	< 1	19	< 32	< 32	7	--	Confirmation
P08-04 (LAB)			0.32	--	--	--	--	--	--	UR

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P09-04	8/9/95	14:00	**>1**	< 1	17	< 30	< 32	64	--	PCB only
P09-04 (LAB)			0.98	--	--	--	--	--	--	UR
P10-04	8/10/95	13:30	**>1**	< 1	13	< 32	< 38	60	--	PCB only
P10-04 (LAB)			**4.3**	--	--	--	--	--	--	MTCA
P11-04	8/21/95	16:35	< 1	< 1	11	< 30	< 36	9.3	--	UR
P12-04	8/14/95	10:00	**>1**	< 1	18	< 34	< 40	64	--	PCB only
P12-04 (LAB)			**2.4**	--	--	--	--	--	--	MTCA
P13-04	8/17/95	11:30	**>1**	< 1	17	< 32	50	49	--	PCB only
P13-04 (LAB)			**< 7.4**	--	--	--	--	--	--	MTCA
P14-04	8/15/95	15:00	**>1**	< 1	11	< 34	< 40	30	--	PCB only
P14-04 (LAB)			0.85	--	--	--	--	--	--	UR
P01-05	8/16/95	13:30	< 1	< 1	12	< 34	< 32	9	--	UR
P02-05	8/15/95	11:15	< 1	< 1	11	< 30	< 32	13	--	UR
P03-05	8/11/95	10:35	**>1**	< 1	12	< 30	< 38	49	--	PCB only
P03-05 (LAB)			0.88	--	--	--	--	--	--	UR
P04-05	8/14/95	11:30	**>1**	< 1	16	< 32	172	61	--	PCB only
P04-05 (LAB)			0.82	--	--	--	--	--	--	UR
P05-05	8/17/95	10:00	**>1**	< 1	19	< 34	< 40	120	--	PCB only
P05-05 (LAB)			**2.4**	--	--	--	--	--	--	MTCA
P06-05	8/29/95	14:45	**> 1**	< 1	9.8	< 32	< 34	< 6	--	PCB only
P06-05 (LAB)			**1.9**	--	--	--	--	--	--	MTCA
P07-05	8/15/95	14:30	< 1	< 1	13	< 34	36	29	--	UR
P08-05	8/18/95	15:24	< 1	< 1	12	< 32	< 36	< 8	--	UR
P09-05	8/14/95	16:20	< 1	< 1	14	< 34	< 38	12	--	UR
P10-05	8/17/95	9:30	**>1**	**>1**	< 10	< 32	< 40	125	--	PCB, PAH
P10-05 (LAB)			**2.1**	**6.5**	--	--	--	--	--	MTCA
P11-05	8/22/95	15:30	**>1**	< 1	12	< 32	< 36	27	--	PCB only
P11-05 (LAB)			**1.6**	--	--	--	--	--	--	MTCA
P12-05	8/22/95	9:00	**>1**	< 1	13	< 32	< 36	< 6	--	PCB only
P12-05 (LAB)			**7.6**	--	--	--	--	--	--	MTCA

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P13-05	8/23/95	15:20	**>1**	< 1	9.6	< 34	< 36	< 6.4	--	PCB only
P13-05 (LAB)			**11**	--	--	--	--	--	--	MTCA
P14-05	8/21/95	15:10	**>1**	**>1**	14	< 34	< 36	24	--	PCB, PAH
P14-05 (LAB)			**6.1 / 7.1**	0.55 / 0.60	--	--	--	--	--	MTCA
P01-06	8/17/95	16:00	**>1**	**>1**	18	< 34	50	70	--	PCB, PAH
P01-06 (LAB)			0.98	**1.5**	--	--	--	--	--	MTCA
P02-06	8/16/95	15:00	**>1**	< 1	13	< 34	< 38	44	--	PCB only
P02-06 (LAB)			**1.7**	--	--	--	--	--	--	MTCA
P03-06	8/16/95	16:45	**>1**	**>1**	18	< 32	< 40	96	--	PCB, PAH
P03-06 (LAB)			**2.5 / 2.5**	**4.8 / 4.5**	--	--	--	--	--	MTCA
P04-06	8/17/95	15:00	< 1	**>1**	19	< 34	< 40	26	--	PAH only
P04-06 (LAB)			--	0.79	--	--	--	--	--	UR
P05-06	8/25/95	14:30	**>1**	< 1	13	< 32	< 34	< 6	--	PCB only
P05-06 (LAB)			**6**	--	--	--	--	--	--	MTCA
P07-06	8/18/95	11:30	**>1**	< 1	12	< 32	< 36	26	--	PCB only
P07-06 (LAB)			**1.6 / 1.4**	--	--	--	--	--	--	MTCA
P08-06	8/21/95	14:45	< 1	< 1	11	< 34	< 36	10	--	UR
P09-06	8/15/95	16:10	**>1**	< 1	19	< 34	< 40	64	--	PCB only
P09-06 (LAB)			**1.1**	--	--	--	--	--	--	MTCA
P10-06	8/25/95	11:00	**>1**	< 1	12	< 34	< 36	< 6	--	PCB only
P10-06 (LAB)			**5.8**	--					--	MTCA
P01-07	8/28/95	10:00	**>1**	< 1	< 6	< 32	< 34	< 6	--	PCB only
P01-07 (LAB)			**5.2**	--	--	--	--	--	--	MTCA
P02-07	8/23/95	10:40	< 1	< 1	14	< 32	< 38	15	--	UR
P03-07	8/23/95	10:00	< 1	< 1	9.4	< 30	< 36	30	--	UR
P04-07	8/24/95	15:10	**>1**	< 1	12	< 32	< 34	< 6	--	PCB only
P04-07 (LAB)			**16**	--	--	--	--	--	--	MTCA
P07-07	8/25/95	11:15	**> 1**	< 1	< 6	< 34	< 36	7.2	--	PCB only
P07-07 (LAB)			**7.3**	--	--	--	--	--	--	MTCA

TABLE 2-1
FIELD AND LABORATORY RESULTS - STOCKPILE SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
P08-07	8/22/95	13:55	>1	< 1	19	32	< 36	29	--	PCB only
P08-07 (LAB)			**4.6**	--	--	--	--	--	--	MTCA
P09-07	8/21/95	14:00	< 1	< 1	13	< 32	< 34	< 6	--	UR
P01-08	9/7/95	13:15	< 10	< 10	14	< 32	< 36	27	--	MTCA
P02-08	8/24/95	14:00	>1	< 1	12	< 30	< 34	20	--	PCB only
P02-08 (LAB)			**1.3**	--	--	--	--	--	--	MTCA
P03-08	8/24/95	11:05	>1	< 1	<6	< 32	< 36	7.1	--	PCB only
P03-08 (LAB)			**16**	--	--	--	--	--	--	MTCA
P08-08	8/29/95	11:00	> 1	< 1	9.4	< 34	< 34	< 6	--	PCB only
P08-08 (LAB)			**1.2**	--	--	--	--	--	--	MTCA
P09-08	8/22/95	11:30	>1	< 1	18	< 32	< 38	37	--	PCB only
P09-08 (LAB)			**1.7**	--	--	--	--	--	--	MTCA
P02-09	8/30/95	14:20	>1	< 1	14	< 34	< 36	6.6	--	PCB only
P02-09 (LAB)			**1.4**	--	--	--	--	--	--	MTCA
P03-09	8/30/95	15:00	>1	< 1	12	< 34	< 36	7.3	--	PCB only
P03-09 (LAB)			0.63	--	--	--	--	--	--	UR
P09-09	8/29/95	13:30	>1	< 1	12	< 34	< 36	< 6	--	PCB only
P09-09 (LAB)			**12**	--	--	--	--	--	--	MTCA

Notes:

UR - Material was moved to the "clean" pile.
MTCA - Material was moved to the Model Toxics Control Act pile.
DW - Material was moved to the Dangerous Waste pile.
(--) - Not Analyzed

TABLE 2-2

LABORATORY RESULTS - VERIFICATION SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
BDA95 - VS-01	7/21/95	15:20	0.82	< 1	< 17	1.2	17	11	< 0.21	UR
BDA95-VS-02	8/17/95	8:00	< 1	< 1	< 10	< 1.0	20	< 10	< 0.25	UR
BDA95-VS-03	8/17/95	8:10	**75**	< 1	< 9.5	1.2	27	< 9.5	< 0.25	Stockpile
BDA95-VS-3A	8/22/95	14:00	0.11	< 1	< 10	< 1.0	20	< 10	< 0.25	UR
BDA95-VS-04	8/17/95	8:25	**20**	< 1	10	< 0.99	19	< 9.9	< 0.25	Stockpile
BDA95-VS-4A	8/22/95	9:50	0.76	< 1	< 15	0.86	19	< 7.5	< 0.25	UR
BDA95-VS-05	8/17/95	13:05	0.078	< 1	< 9.2	< 0.92	16	< 9.2	< 0.25	UR
BDA95-VS-06	8/18/95	9:00	**11 / 10**	< 1/ < 1	<17 / <17	<.86/<.87	25 / 21	<8.6 / <8.7	<.25 / <.25	Stockpile
BDA95-VS-6A	8/29/95	15:00	**36**	< 1	< 18	< 0.88	23	< 8.8	< 0.25	Undetermined
BDA95-VS-07	8/22/95	10:10	0.12	< 1	< 19	0.97	21	< 9.3	< 0.25	UR
BDA95-VS-08	8/22/95	10:25	0.69	< 1	< 19	1.3	19	< 9.6	< 0.25	UR
BDA95-VS-09	8/22/95	11:07	< 1	< 1	< 19	< 0.94	17	< 9.4	< 0.25	UR
BDA95-VS-10	8/22/95	13:55	< 1	< 1	< 19	1.1	20	< 9.6	< 0.25	UR
BDA95-VS-11	8/22/95	13:00	0.31	0.59	< 18	1.1	22	9.9	< 0.25	UR
BDA95-VS-12	8/22/95	11:10	0.057	< 1	< 19	1.1	22	< 9.4	< 0.25	UR
BDA95-VS-13	8/22/95	10:30	< 1	< 1	< 19	< 0.96	18	< 9.6	< 0.25	UR
BDA95-VS-14	8/22/95	10:15	< 1/ < 1	< 1/< 1	< 19 / <18	1 / 0.96	20 / 21	< 9.7/< 9.2	0.25/<0.2	UR
BDA95-VS-15	8/18/95	10:00	**2.7**	<1	< 15	< 0.74	45	< 7.4	< 0.25	Stockpile
BDA95-VS-15A	8/24/95	10:00	< 1	< 1	< 15	1.5	16	< 7.6	< 0.25	UR
BDA95-VS-16	8/17/95	13:20	0.037	< 1	< 9.5	1.1	41	< 9.5	< 0.25	UR
BDA95-VS-17	8/17/95	9:30	< 1	< 1	11	1.7	30	< 9.1	< 0.25	UR
BDA95-VS-18	8/17/95	9:00	0.095 / <1	< 1 / < 1	13 / 12	1.1/< 1.	26 / 26	< 11/< 11	0.25/<0.2	UR
BDA95-VS-19	8/17/95	8:50	< 1	< 1	12	< 1.0	19	< 10	< 0.25	UR
BDA95-VS-20	8/18/95	8:30	< 1	< 1	< 16	< 0.78	22	< 7.8	< 0.25	UR
BDA95-VS-21	8/18/95	8:40	< 1	< 1	< 19	< 0.96	20	< 9.6	< 0.25	UR
BDA95-VS-22	8/18/95	8:50	0.11	< 1	< 20	< 1	21	< 10	< 0.25	UR
BDA95-VS-23	8/18/95	10:20	0.44	< 1	< 19	< 0.95	17	< 9.5	< 0.25	UR
BDA95-VS-24	8/22/95	10:20	0.04	< 1	< 19	1.5	25	< 9.6	< 0.25	UR
BDA95-VS-25	8/22/95	11:00	< 1 / < 1	< 1< 1	< 19/< 19	1.1 / 1.1	25 / 25	< 9.6/< 9.3	0.25/<0.2	UR
BDA95-VS-26	8/22/95	11:30	0.08	< 1	< 17	1.2	18	< 8.4	< 0.25	UR

TABLE 2-2

LABORATORY RESULTS - VERIFICATION SAMPLES

Sample ID	Sample Date	Sample Time	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standards:			**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
BDA95-VS-27	8/22/95	11:50	< 1	< 1	< 18	1.3	24	< 8.9	< 0.25	UR
BDA95-VS-28	8/18/95	11:25	< 1	< 1	< 16	< 0.78	14	< 7.8	< 0.25	UR
BDA95-VS-29	8/18/95	11:30	0.052	< 1	< 20	< 1	20	< 10	< 0.25	UR
BDA95-VS-30	8/22/95	11:45	< 1	< 1	< 17	0.98	17	< 8.3	< 0.25	UR
BDA95-VS-31	8/22/95	11:40	0.18	0.076	< 18	0.99	17	19	< 0.25	UR
BDA95-VS-32	8/22/95	11:40	**5.4**	< 1	< 19	1.5	24	< 9.4	< 0.25	Stockpile
BDA95-VS-32A	8/30/95	15:30	< 1	< 1	< 16	< 0.78	23	< 7.8	< 0.25	UR
BDA95-VS-33	8/17/95	11:00	0.26	0.015	< 9.3	2.1	21	< 9.3	< 0.25	UR
BDA95-VS-34	8/17/95	10:30	**1.3**	0.11	< 10	1.5	41	150	< 0.25	Stockpile
BDA95-VS-34A	8/23/95	11:00	0.43	0.022	< 20	3.4	30	21	< 0..25	UR
BDA95-VS-35	8/17/95	11:30	<1	< 1	15	1.1	53	< 9.6	< 0.25	UR
BDA95-VS-36	8/18/95	9:10	0.72	0.31	< 20	2.3	37	35	< 0.25	UR
BDA95-VS-37	8/18/95	11:00	0.064	< 1	< 19	< 0.94	20	< 9.4	< 0.25	UR

Notes:

UR - Material was moved to the "clean" pile.

Stockpile - Material was moved to a sampling stockpile.

TABLE 2-3
FIELD LABORATORY RESULTS -DEMOBILIZATION SAMPLES

Sample ID	Sample Date	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standar		**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
BDA95-DS-01	8/23/95	> 1	< 1	12	< 30	< 36	36	--	MTCA
BDA95-DS-1A	8/24/95	< 1	< 1	--	--	--	--	--	UR
BDA95-DS-02	8/31/95	> 1	--	--	--	--	--	--	MTCA
BDA95-DS-02A	9/5/95	< 1	< 1	9.1	< 34	< 36	< 6	--	UR
BDA95-DS-03	8/31/95	> 1	--	--	--	--	--	--	MTCA
BDA95-DS-03A	9/6/95	< 1	< 1	12	< 32	< 36	< 6	--	UR
BDA95-DS-04	8/31/95	> 1	--	--	--	--	--	--	MTCA
BDA95-DS-04A	9/8/95	< 1	< 1	9	< 32	53	15	--	UR
BDA95-DS-05	9/6/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-05A	9/8/95	< 1	< 1	< 8	< 36	79	44	--	UR
BDA95-DS-06	9/8/95	> 1	--	--	--	--	--	--	MTCA
BDA95-DS-06A	9/8/95	< 1	< 1	12	< 34	< 38	39	--	UR
BDA95-DS-07	9/6/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-07A	9/8/95	< 1	< 1	14	< 36	< 38	15	--	UR
BDA95-DS-08	9/6/95	< 1	< 1	< 8	< 32	96	34	--	UR
BDA95-DS-09	9/8/95	> 1	--	--	--	--	--	--	MTCA
BDA95-DS-09A	9/8/95	< 1	< 1	15	< 34	< 36	< 7	--	UR
BDA95-DS-10	8/31/95	< 1	< 1	16	< 34	< 38	15	--	UR
BDA95-DS-11	9/8/95	< 1	< 1	15	< 32	< 36	< 6	--	UR
BDA95-DS-12	9/6/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-12A	9/8/95	< 1	< 1	15	< 34	< 36	< 7	--	UR
BDA95-DS-13	8/31/95	< 1	< 1	15	< 34	18	11	--	UR
BDA95-DS-14	8/31/95	< 1	< 1	7.9	< 36	< 38	8.9	--	UR
BDA95-DS-15	8/31/95	< 1	< 1	17	< 34	< 38	36	--	UR
BDA95-DS-16	9/6/95	< 1	< 1	14	< 34	< 36	24	--	UR
BDA95-DS-17	9/6/95	> 1	> 1	--	--	--	--	--	MTCA
BDA95-DS-17A	9/7/95	< 1	< 1	13	< 32	< 36	< 6	--	UR
BDA95-DS-18	8/31/95	< 1	< 1	16	< 32	< 38	21	--	UR
BDA95-DS-19	8/31/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-19A	8/31/95	< 1	< 1	7.9	< 34	48	< 6	--	UR

TABLE 2-3
FIELD LABORATORY RESULTS -DEMOBILIZATION SAMPLES

Sample ID	Sample Date	PCB (mg/kg)	PAH (mg/kg)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Cr +6 (mg/kg)	Material Determination
In-Place Management Standar		**1**	**1**	**20**	**80**	**80000**	**250**	**400**	
BDA95-DS-20	8/31/95	< 1	< 1	8.6	< 32	236	70	--	UR
BDA95-DS-21	9/1/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-21A	9/5/95	< 1	< 1	11	< 34	< 36	16	--	UR
BDA95-DS-22	9/1/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-22A	9/5/95	< 1	< 1	7	< 36	< 38	< 6.4	--	UR
BDA95-DS-23	9/1/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-23A	9/5/95	< 1	< 1	9	< 34	< 36	< 6.4	--	UR
BDA95-DS-24	9/7/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-24A	9/8/95	< 1	< 1	8.3	< 34	< 36	7.4	--	UR
BDA95-DS-25	9/7/95	> 1	< 1	--	--	--	--	--	MTCA
BDA95-DS-25A	9/8/95	< 1	< 1	9.4	< 34	< 34	< 6	--	UR
BDA95-DS-26	9/8/95	< 1	< 1	< 6.2	< 36	< 34	< 6.2	--	UR
BDA95-DS-27	9/7/95	< 1	< 1	14	< 34	< 38	< 6	--	UR
BDA95-DS-28	9/7/95	< 1	< 1	9	< 34	< 36	11	--	UR
BDA95-DS-29	9/8/95	< 1	< 1	15	< 34	< 36	11	--	UR
BDA95-DS-30	9/8/95	< 1	< 1	12	< 32	< 36	19	--	UR
BDA95-DS-31	9/8/95	< 1	< 1	11	< 32	< 36	9.7	--	UR
BDA95-DS-32	9/8/95	< 1	< 1	< 6.4	< 34	< 36	13	--	UR
BDA95-DS-33	8/30/95	< 1	< 1	12	< 34	< 40	13	--	UR

Notes:

UR - Material was moved to the "clean" pile.

MTCA - Material was moved to the Model Toxics Control Act pile.

(--) - Not Analyzed

TABLE 3-1

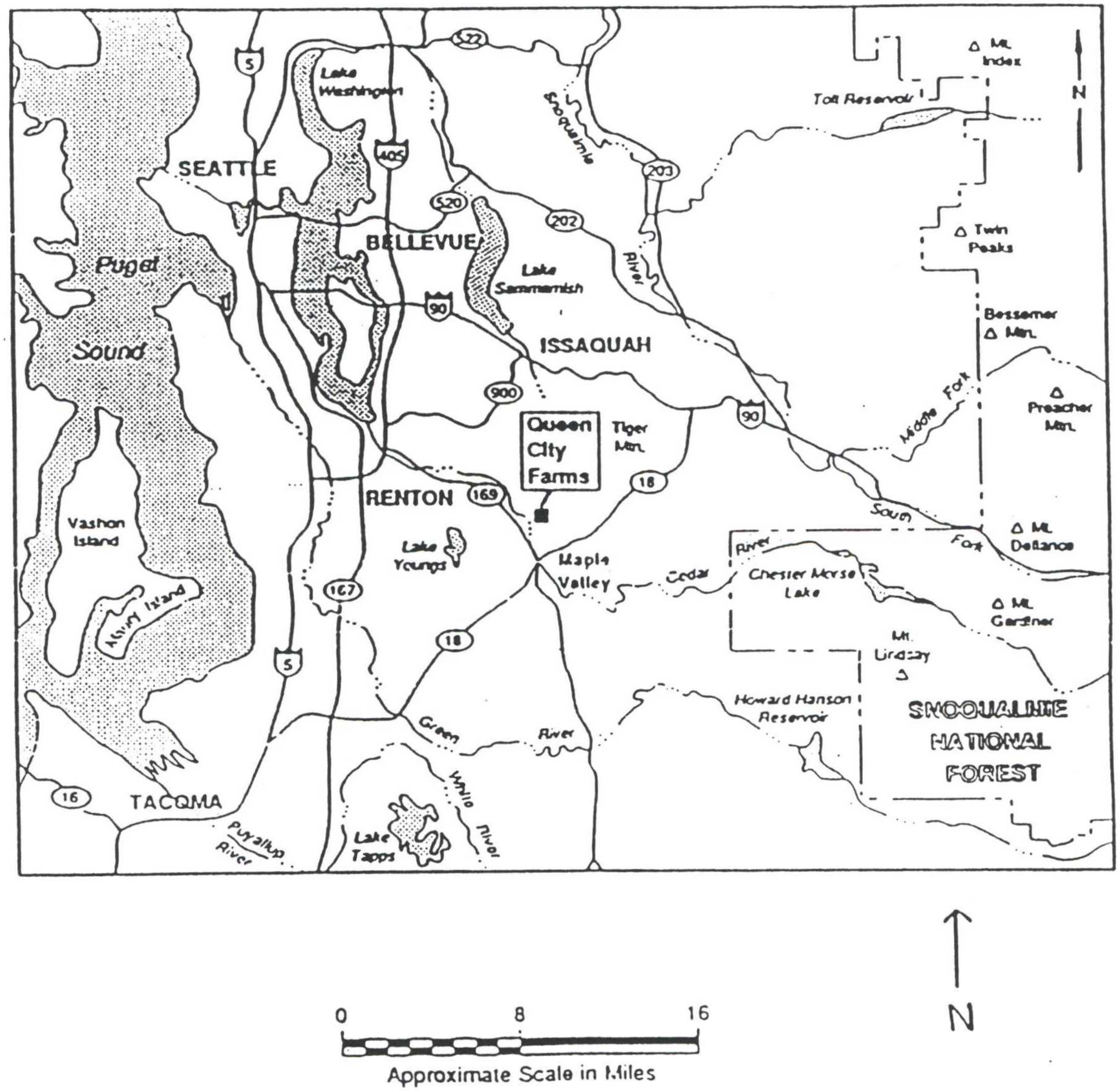
COMPLETION OF SCHEDULED MILESTONES

Task/Item	Proposed	Negotiated	Anticipated	Actual
Notice-to-proceed	Mar 23rd	Mar 23rd		Mar 23rd
Kick off meeting	Mar 23rd	Mar 23rd		Mar 23rd
Draft TRD to Boeing	May 8th	May 8th		May 8th
Draft TRD to agencies	N/A	N/A		May 25th
Agency approval of TRD	Jul 7th	Jul 7th		Jul 5th
Mobilization	Jul 12th	Jul 12th		Jul 18th
Clearing/grubbing	Jul 14th	Jul 14th		Jul 17th
Fence removal	Jul 12th	Jul 12th		Jul 12th
Erosion control	Jul 14th	Jul 14th		Jul 14th
Stockpile preparation	Jul 18th	Jul 18th		Jul 18th
Initial excavation	Jul 18th	Jul 18th		Jul 19th
Excavation	Aug 17th	Aug 17th		Sep 11th
Drum/container handling	Aug 17th	Aug 17th		Sep 15th
Field screening/sampling	Aug 21st	Aug 21st		Sep 11th
Stockpile/store soils, etc.	Aug 21st	Aug 21st		Sep 11th
Verification sampling	Aug 21st	Aug 21st		Sep 11th
Backfill clean soils	Aug 17th	Aug 17th		Sep 22nd
Import/place backfill	Aug 24th	Aug 24th		Sep 22nd
Site restoration	Sep 5th	Sep 5th		Sep 22nd
Demobilization	Sep 8th	Sep 8th		Sep 22nd
Complete fieldwork	Sep 8th	Sep 8th		Sep 22nd
Kick off Closure Report	Sep 11th	Sep 11th		Sep 11th
Draft Closure Report	Nov 1st	Nov 1st		Nov 1st
Boeing review - DCR	Nov 15th	Nov 15th		Dec 1st
"Final" CR to agencies	Nov 27th	Nov 27th		Dec 18th

Note: The Final Closure Report is specified as due to the EPA within 60 days of the Final Inspection (October 26, 1995) which is December 25, 1995.

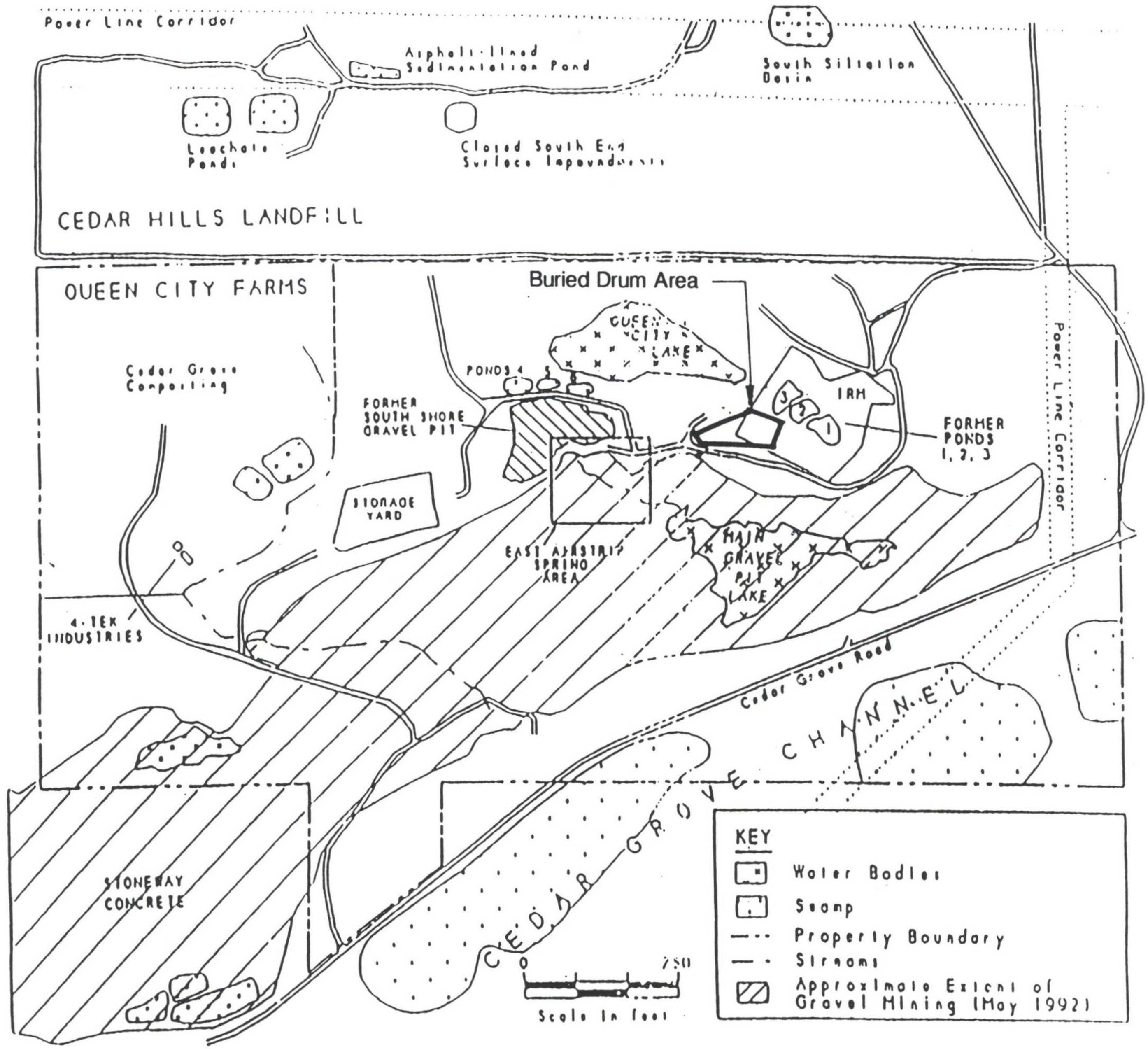
FIGURES

FIGURES



GR052/QueenCity

Queen City Farms BOEING	Project No. 944057NA	Site Location	Figure 1-1
Woodward-Clyde			

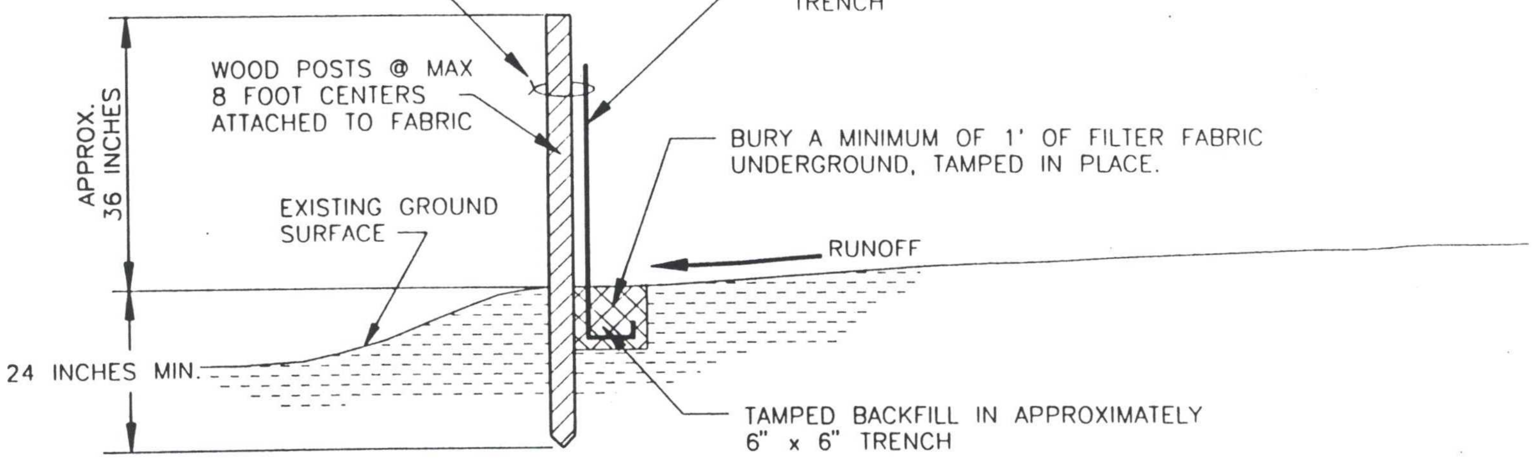


Queen City Farms BOEING	Project No. 944057NA	General Site Plan	Figure 1-2
Woodward-Clyde			

Boeing Queen City Farms
Buried Drum Excavation Project

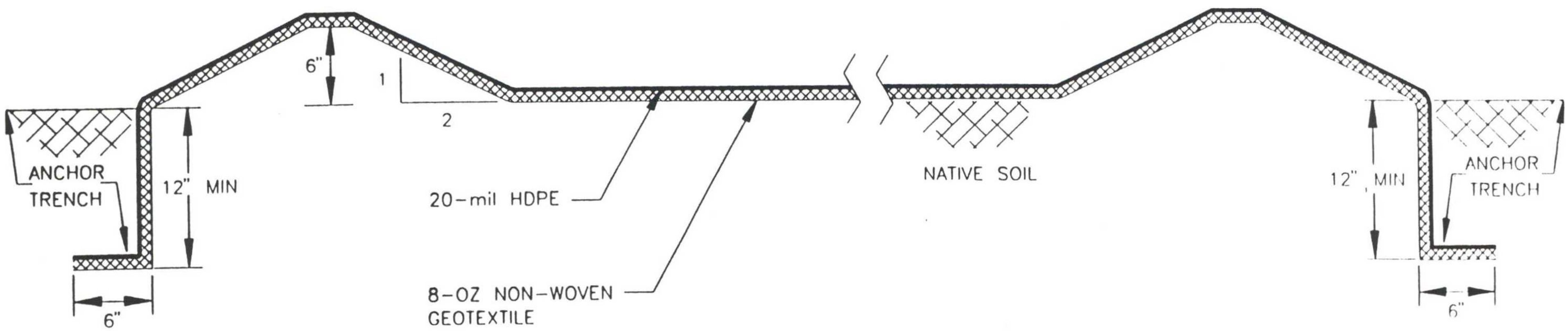
ID	Task Name	Duration	Start	Finish
1	Notice to Proceed/Execution of subcontract	0d	Thu 3/23/95	Thu 3/23/95
2	Task Kickoff Meeting	1d	Fri 3/24/95	Fri 3/24/95
3	Develop Draft TRD w/Sampling - H & S Plans	20d	Mon 3/27/95	Fri 4/21/95
4	Contract Meeting - Execution of Contract	1d	Tue 4/11/95	Tue 4/11/95
5	Internal Review of TRD Documents	5d	Mon 4/24/95	Fri 4/28/95
6	Rewrite and Finalize TRD	5d	Mon 5/1/95	Fri 5/5/95
7	TRD Submission for 5/1/95 delivery	1d	Mon 5/8/95	Mon 5/8/95
8	Boeing Review of TRD	8d	Tue 5/9/95	Thu 5/18/95
9	Revision of TRD	5d	Fri 5/19/95	Thu 5/25/95
10	Submit TRD to Agency for Review	0d	Thu 5/25/95	Thu 5/25/95
11	EPA/USACE review/approval of TRD	31d	Fri 5/26/95	Mon 7/10/95
12	TRD Approval	0d	Mon 7/10/95	Mon 7/10/95
13	Mobilization	2d	Tue 7/11/95	Wed 7/12/95
14	Clearing & Grubbing	3d	Thu 7/13/95	Mon 7/17/95
15	Fence Removal	1d	Thu 7/13/95	Thu 7/13/95
16	Erosion Control	2d	Fri 7/14/95	Mon 7/17/95
17	Dangerous Waste Stockpile Prep	0.5d	Tue 7/18/95	Tue 7/18/95
18	MTCA Soil Stockpile Prep	1.5d	Tue 7/18/95	Wed 7/19/95
19	Sampling Stockpile Area Prep	1d	Tue 7/18/95	Tue 7/18/95
20	Excavation to Sampling Area - Air Monitoring	3d	Wed 7/19/95	Fri 7/21/95
21	Excavation to Sampling Area	20d	Mon 7/24/95	Fri 8/18/95
22	Drum & Container Handling	23d	Wed 7/19/95	Fri 8/18/95
23	Field Screening and Sampling	25d	Wed 7/19/95	Tue 8/22/95
24	Stockpile and Store DW Materials	23d	Thu 7/20/95	Mon 8/21/95
25	Stockpile & Store MTCA Materials	23d	Thu 7/20/95	Mon 8/21/95
26	Verification Sampling	12d	Fri 8/4/95	Mon 8/21/95
27	Move Clean Material to Backfill	6d	Thu 8/10/95	Thu 8/17/95
28	Import and Place Backfill	5d	Fri 8/18/95	Thu 8/24/95
29	Site Restoration	7d	Fri 8/25/95	Tue 9/5/95
30	Demobilization/Site Cleanup	13d	Tue 8/22/95	Fri 9/8/95
31	Completion of Fieldwork	0d	Fri 9/8/95	Fri 9/8/95
32	Kickoff Meeting for Closure Plan	1d	Mon 9/11/95	Mon 9/11/95
33	Develop Draft Closure Plan incl. As-builts	28d	Tue 9/12/95	Thu 10/19/95
34	Internal Closure Plan Document Review	4d	Fri 10/20/95	Wed 10/25/95
35	Rewrite and Finalization of Closure Document	5d	Thu 10/26/95	Wed 11/1/95
36	Closure Documents Submission to Boeing	0d	Wed 11/1/95	Wed 11/1/95
37	Boeing review /comment on Closure Document	10d	Thu 11/2/95	Wed 11/15/95
38	Rewrite/respond to Boeing Comments	8d	Thu 11/16/95	Mon 11/27/95
39	Submit Final Closure Document to Boeing	0d	Mon 11/27/95	Mon 11/27/95

FIGURE 2-1
PROPOSED SCHEDULE



EROSION CONTROL BARRIER

NOT TO SCALE

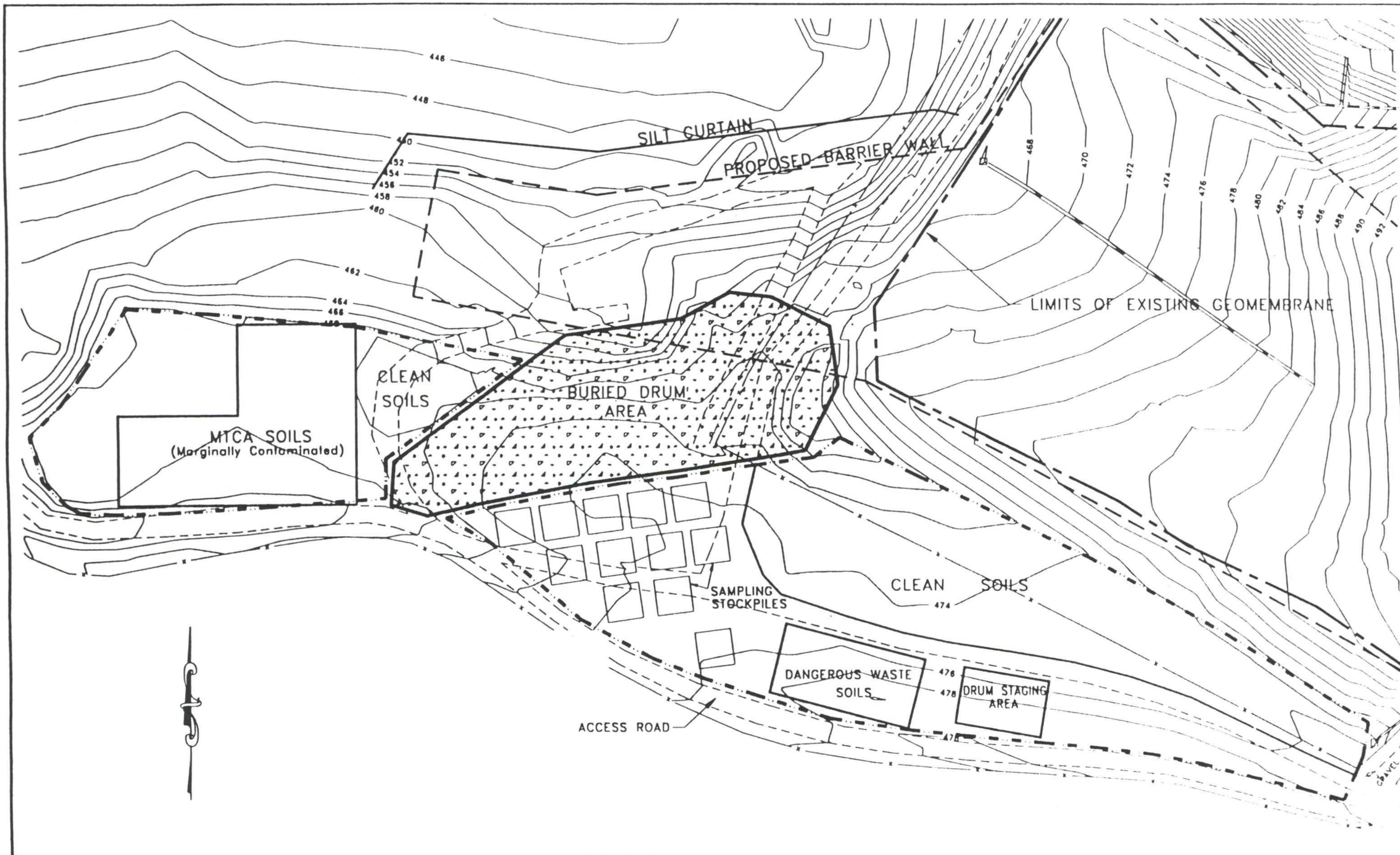


SECTION – DRUM CONTAINMENT AREA

VERTICAL SCALE 1" = 1'

Queen City Forms BOEING	Project No. 944057NA	Erosion Control Barrier Detail and Drum Containment Area Cross Section	Figure 2-2
Woodward-Clyde			

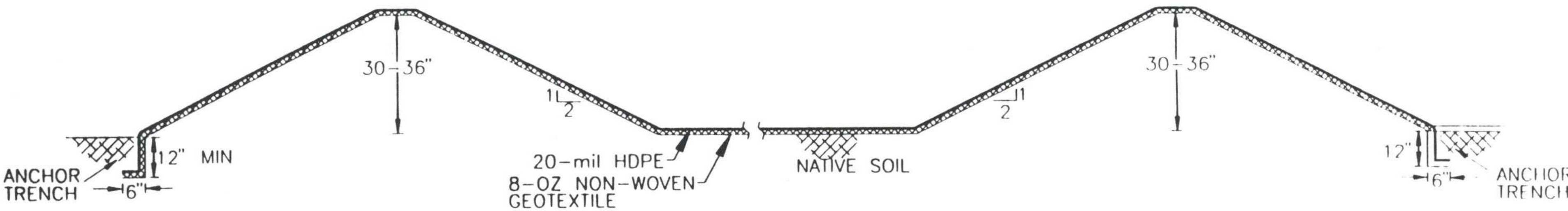
ROF 09.DWG



Queen City Farms BOEING	Project No. 944057NA
Woodward-Clyde	

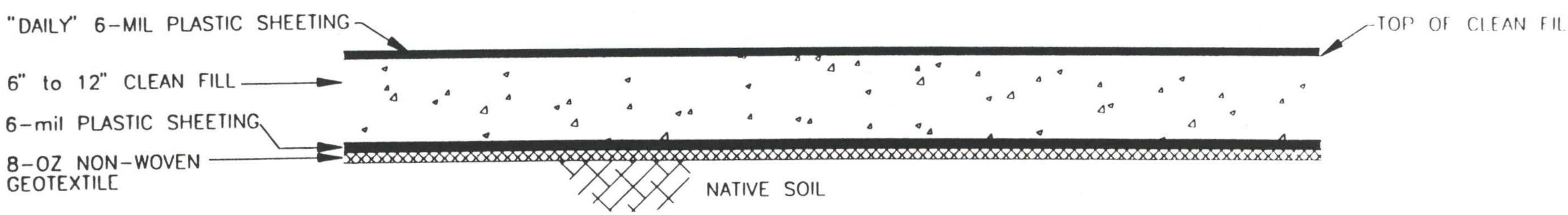
Proposed Soil Staging Plan

Figure 2-3



SECTION – DANGEROUS WASTE STOCKPILE AND MARGINALLY CONTAMINATED SOIL STOCKPILE AREAS

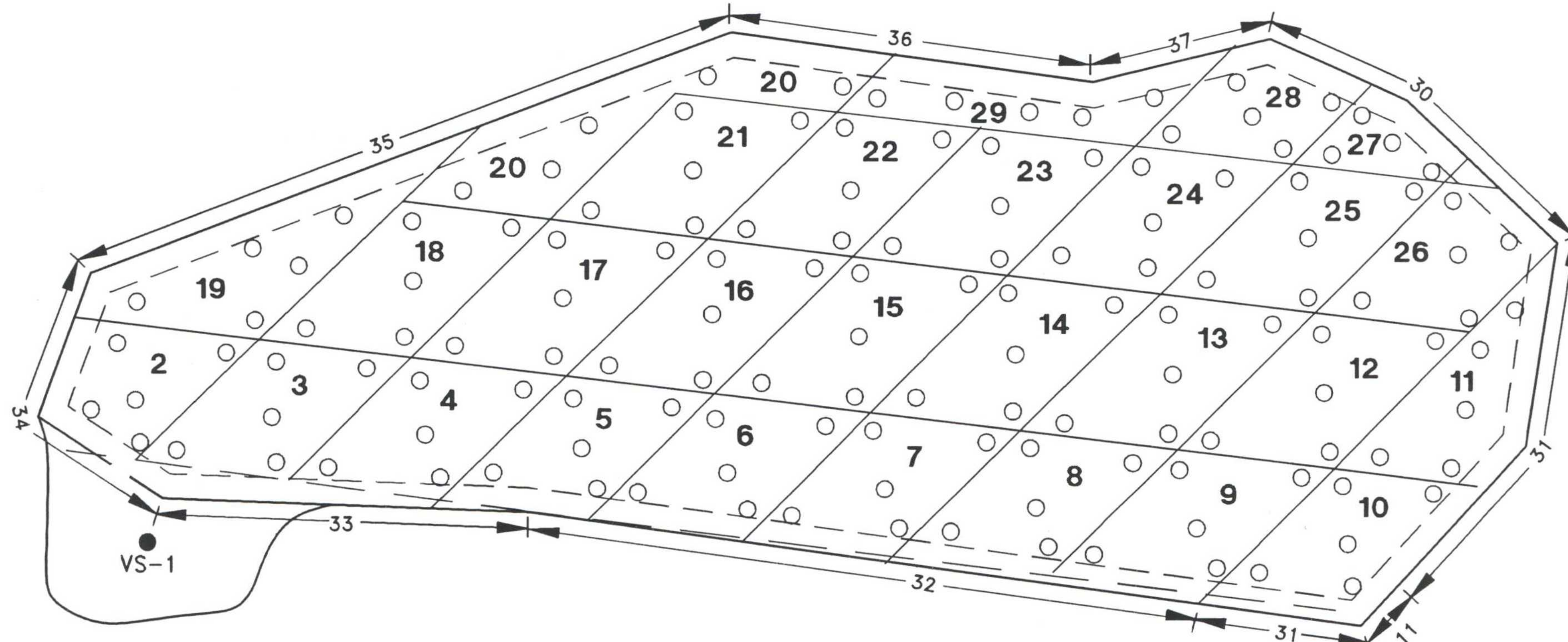
VERTICAL SCALE: 1" = 4'



SECTION – INTERIM SOIL STAGING AREAS

VERTICAL SCALE: 1" = 1'

Queen City Farms BOEING	Project No. 944057NA	Dangerous Waste, Marginally Contaminated Soil, and Interim Soil Staging Areas Cross Sections	Figure 2-4
Woodward-Clyde			



LEGEND

OUTLINE OF EXCAVATION AND SIDEWALLS LAID–DOWN IN PLANE OF PLAN

EXCAVATION BOUNDARY

ALIQUOT TO BE COMPOSITED (5 IN EACH SECTION)

37 SIDEWALL SAMPLE COMPOSITED ALONG 100 FEET

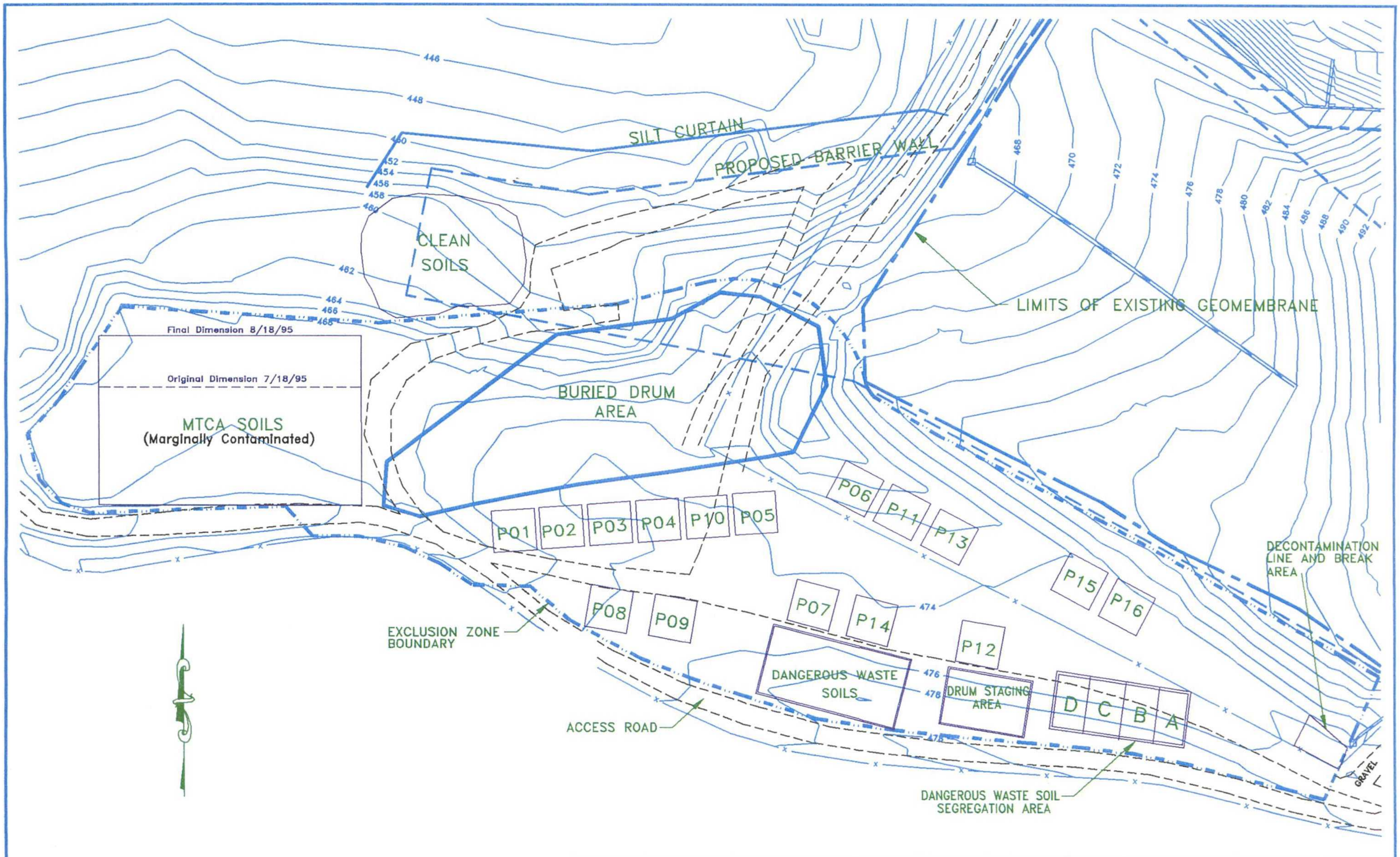
SOURCE: STATISTICAL METHODS FOR ENVIRONMENTAL POLLUTION MONITORING (GILBERT, 1987).

VERIFICATION SAMPLING GRID BASED ON STATISTICAL SAMPLING AND ANALYSIS (GILBERT)

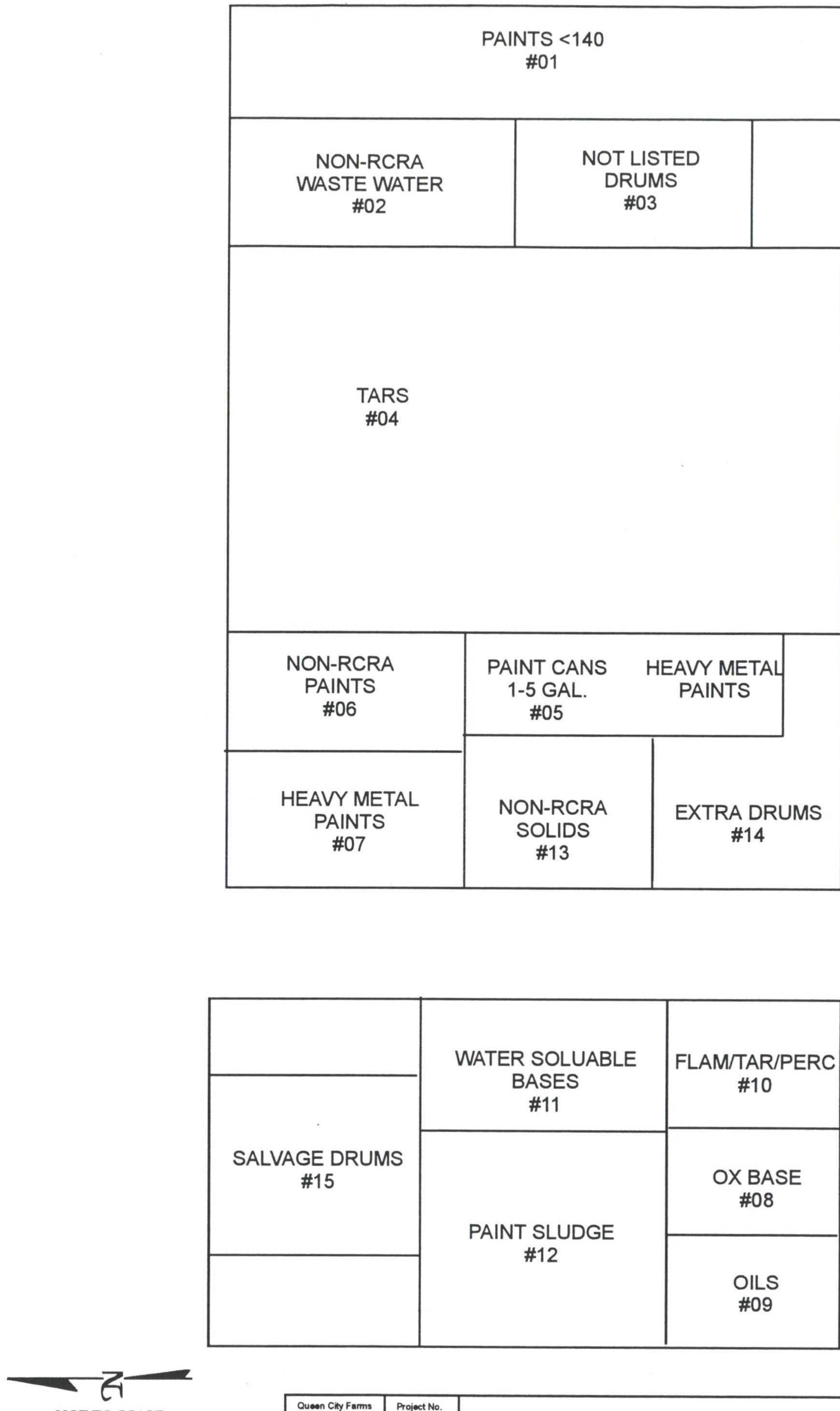
Project No.: 944057NA	Date: OCT. 1995	Project: QUEEN CITY FARMS BDA	Fig.: 2–5

BOE–GRID
10/13/95

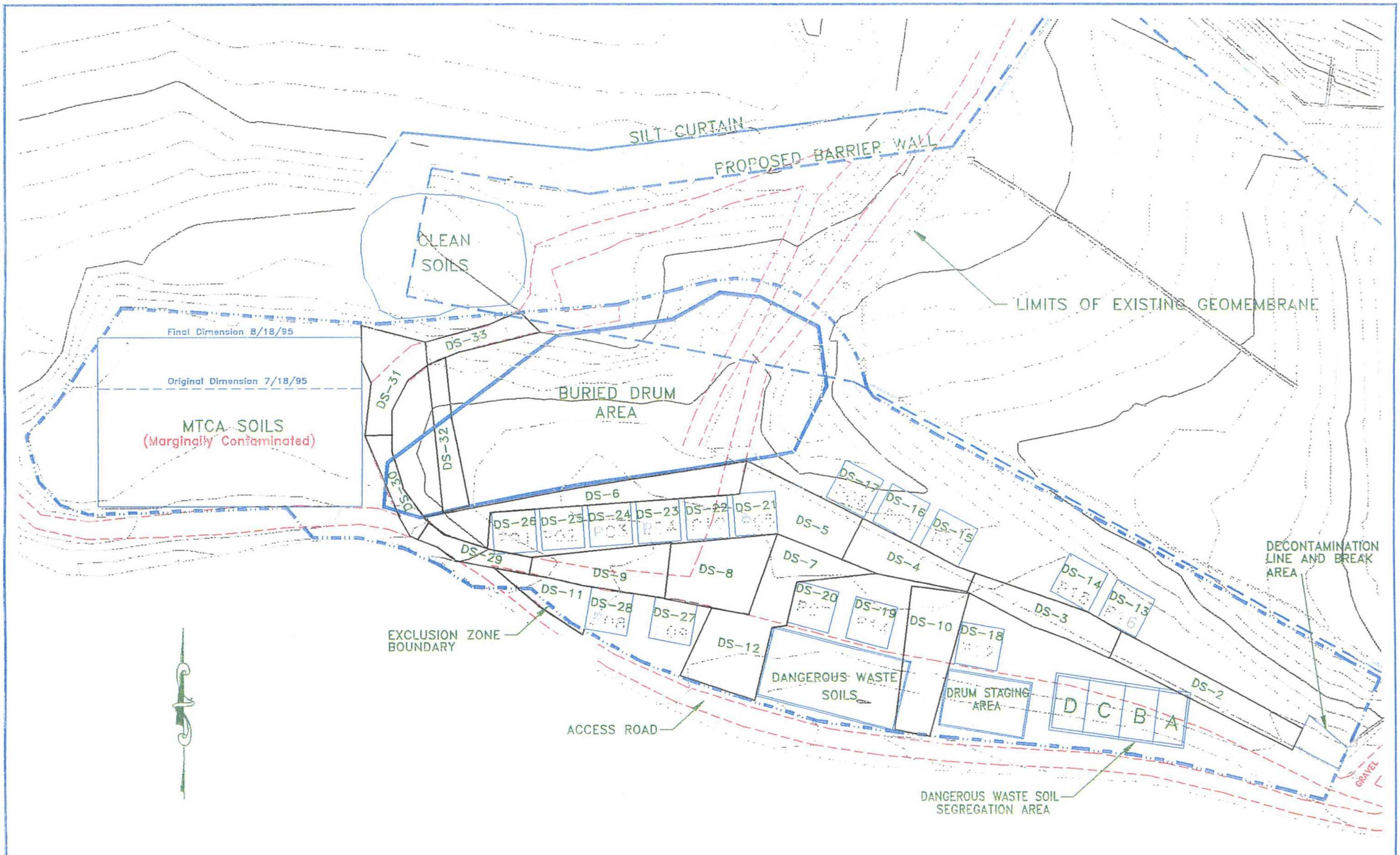
Woodward-Clyde Consultants



Queen City Farms BOEING	Project No. 944057NA	Site Soil Staging and Work Areas	Figure 2-6
Woodward-Clyde			

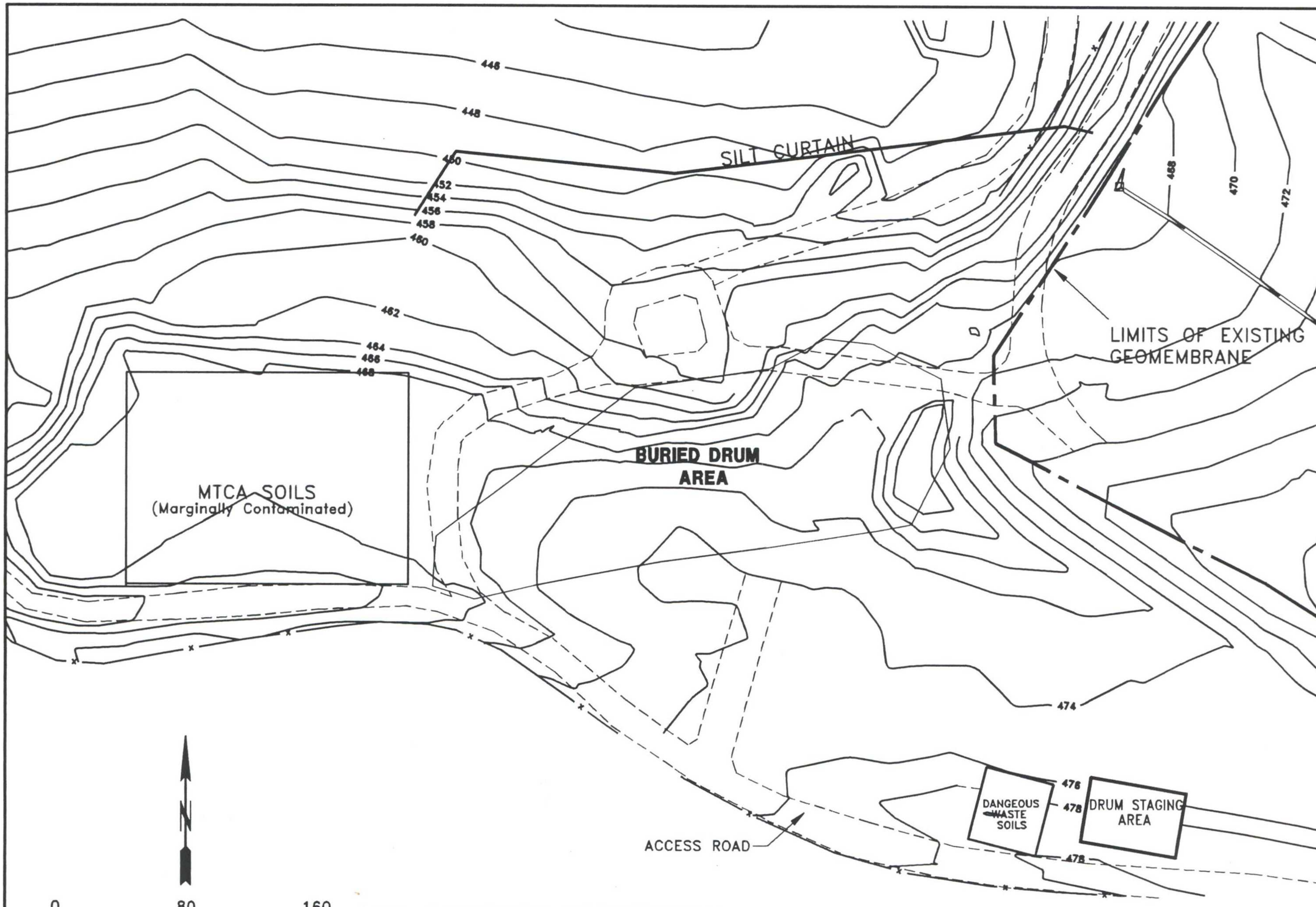


Queen City Farms BOEING	Project No. 944057NA	Drum Waste Stream Staging Plan	Figure 2-7
Woodward-Clyde			



Queen City Farms BOEING	Project No. 944057NA	Demobilization Sampling Grid	Figure 2-8
Woodward-Clyde			

BOEPRP02.DWG



Queen City Farms BOEING	Project No. 944057NA	SITE CONDITIONS FOLLOWING RESTORATION AND DEMOBILIZATION	Figure 4-1
Woodward-Clyde			

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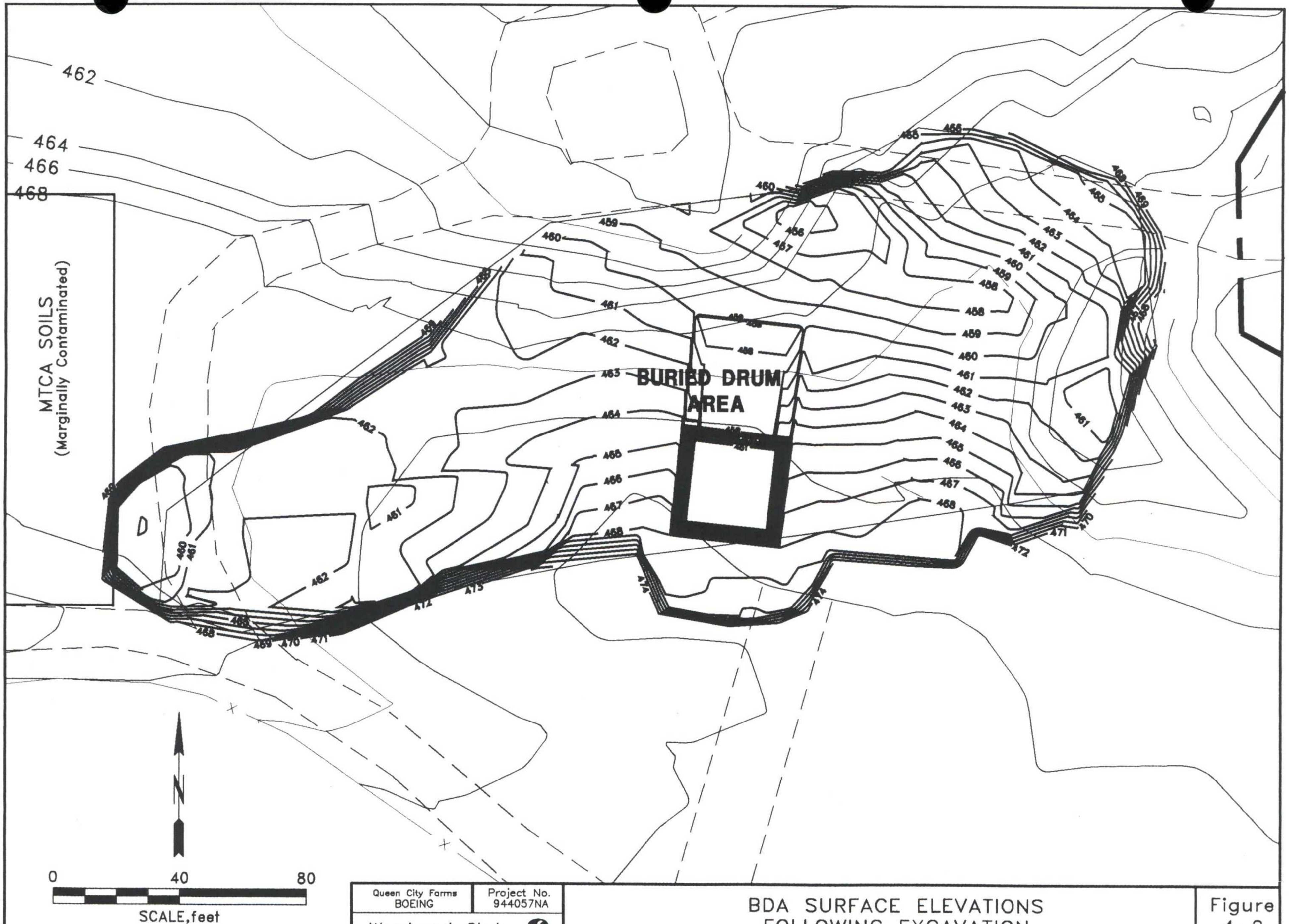

Queen City Farms BOEING | Project No. 944057NA

Woodward–Clyde

BDA SURFACE ELEVATIONS FOLLOWING EXCAVATION

Figure 4–2

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